

Med. g. 468^o

Transactions

THE
TRANSACTIONS
OF THE
AMERICAN
MEDICAL ASSOCIATION.

INSTITUTED 1847.

VOL. XXX.

PHILADELPHIA:
PRINTED FOR THE ASSOCIATION.
COLLINS, PRINTER, 705 JAYNE STREET.
1879.



By a Resolution passed at the session of 1851, the Committee of Publication were instructed to print conspicuously, at the beginning of the volume of the *Transactions*, the following disclaimer:—

“The American Medical Association, although formally accepting and publishing the Reports of the various Standing Committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.”

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MINUTES
OF THE
THIRTIETH ANNUAL MEETING
OF THE
AMERICAN MEDICAL ASSOCIATION,

Held in the City of Atlanta, Ga., May 6th, 7th, 8th, and 9th, 1879.

THE Association assembled in De Give's Opera House on Tuesday, May 6th, at 11 A. M., and was called to order by the President, Dr. THEOPHILUS PARVIN, of Indiana.

Vice-Presidents, Dr. A. J. FULLER, of Maine; Dr. W. F. WESTMORELAND, of Georgia; Dr. JOHN MORRIS, of Maryland; and Dr. JOHN H. MURPHY, of Minnesota; the Permanent Secretary, Dr. WILLIAM B. ATKINSON, of Pennsylvania; the Assistant Secretary, Dr. J. SCOTT TODD, of Georgia; and the Treasurer, Dr. RICHARD J. DUNGLISON, of Pennsylvania, occupied their official positions.

The session was opened with prayer by the Rev. D. W. GWIN, of Atlanta, Georgia.

Dr. JOSEPH P. LOGAN, of Georgia, on behalf of the Committee of Arrangements, welcomed the delegates as follows:—

Mr. President and Members of the American Medical Association:

In accordance with the appointment at your meeting in Buffalo, in 1878, it becomes my honor to receive you; and, in conformity with custom and propriety, and in behalf of the medical profession and people of this city, it is my pleasant duty to greet you with a few words of welcome at this hour.

In glancing over some of the volumes of the Transactions of this body a few days ago, with a view of determining the character of the address which, as your chairman of the Committee of Arrangements, would be appropriate to this occasion, I confess

that my heart failed me when I read the long catalogue of attractions of various cities, as presented by my predecessors in this position. The grandeur and beauty of nature by which a number are surrounded, the vast proportions of others, the works of art and science, and benevolence, which are conspicuous features of many of them, the evidences of a profuse display of elegant and refined hospitality exhibited by all, were not calculated to give me confidence in alluding to the advantages of this town, until I recalled the remark of somebody—supposed to be good authority—that, as no individual was able to give any sufficient reason why Atlanta should have attained its present dimensions and importance, so no one could prove that it was not possible that, in the future she might become as large as London.

Like any true citizen of this presuming town, I then took heart, and determined to welcome you boldly to a city of great possibilities. Not many years ago Atlanta was simply a railroad terminus; but under some mysterious influence—already alluded to—it had grown up at the time of the late war to a smart little town of some twelve or fifteen thousand inhabitants; but with the desolations of that period, it was literally burned up, and scarcely one stone was left upon another; but yet, as under the power of some magic wand, it has sprung, in little more than a decade, into a city of forty thousand people, and to-day, in all the substantial elements of a city, is increasing in importance, in fully as rapid a ratio as at any period of her history.

We have not, however, my friends, sat down in ignoble lamentations over our misfortunes, but have gone to work with energy and determination to rebuild and make better our desolated places; and yet with all the presumption and mystery which has surrounded our history, something of our progress must be attributed to the fact that, at an early period after the war between the States, Atlanta as the terminus of a number of arteries of trade and travel, became the capital of a State, great in all the natural, if but partially developed resources which go to make up an empire, as exhibited in her vast surface of fertile and kindly soil, with its varied productions of cotton, corn, wheat, rice, sugar, and luscious fruits, her illimitable water power, her extensive mineral deposits of iron, copper, and gold, her bays and rivers teeming with fish and oysters, and in a large portion of her territory, and especially in the elevated region in which Atlanta is found, a perfection of climate and salubrity throughout the year not to be found, in my judgment, after years of investigation, anywhere else within the broad area of this Union.

Something must also be due to the character of the people of Georgia, as it is their pride to be progressive; and in this respect Atlanta perhaps more decidedly typically represents, and vigorously embodies, the spirit of our growing commonwealth, than any of her many thriving cities. Forgetting the things that are behind, and looking forward to those that are before, whatever

is connected with the advancement of a practical civilization, interests the citizens of this State as a people, whether it be the reform of statesmanship, the inventions of mechanical genius, the operation of great charities, the beneficent ministrations of religion, the regulation of the comprehensive details of commercial traffic, the wise solution of the mighty problems of railway transportation, or the baffling mysteries of medical science in the unselfish mission of relieving human suffering, there is an intelligent interest and a zealous co-operation that have become to be State characteristics.

Atlanta has given evidences that she is not behind the balance of our commonwealth in this spirit of sympathy with every form and phase of moral, social, and scientific advancement. And it is a practical recognition of this spirit that she has been honored by the presence of so many conventions, representing the talent of the nation, engaged in the grandest missions of human intellect and human philanthropy. Great gatherings, not only of national, but international scope, she has been delighted to entertain. In the last few years conventions of railroad magnates, religious celebrities, masonic dignitaries, commercial princes, and political leaders have been held here, and she now extends to your august body a reception that, while it is fervently Southern in its heartiness, is also broadly catholic and national.

Let me beg you not to be precipitate in leaving us, but look into the mystery of this town, and in accordance with one of the most prominent characteristics of our people, who are always looking out for population, and as it must be supposed that we have a great deficiency of medical men, from the constant accession to our numbers, I would suggest that we may yet claim many of you as our fellow-citizens.

To you as physicians it must be interesting to know that there is found an almost entire exemption from malaria and tuberculosis (originating in this region), as well as freedom from any apprehension of a visitation of the awful scourge to which so many of our Southern towns have been subjected. Our gates have time and again been thrown wide open to the fleeing thousands who have found safety from pestilence, and sympathy with misfortune, the benevolence involved, it may be mixed with the selfishness that springs of a security from danger.

And this brings me to remark that, if we cannot offer you much in the way of attractive recreation, we can at least point you to this favorable opportunity for the consideration of the great question of the hour, upon the wise solution of which depends the most momentous interests of health, happiness, and treasure to the whole people of this vast country.

The grand results which have been accomplished in the past in originating and building up sanitary science, have been due to the medical profession, and you have now, in addition to the many other important and interesting investigations which de-

mand your attention, in the impress you may make upon the action of the national sanitary body now in contemporaneous session (to which you are invited), accustomed as you are to self-sacrificing toil, an opportunity to engage in a "labor of love," and a work of mercy, far transcending the gratification of landscape, art, or social life, in this solemn period, when the people of a large portion of the land, having just emerged from the ravages of the deadly plague, are now waiting, as it were, on tiptoe, with deep apprehension, the approach of another season, which may renew the horrors of the past year.

As equally appropriate to the present occasion, and to the intervening history of this desolating plague, craving your patience, I have to detain you a moment in repeating a brief extract from what I had the honor to write in the conclusions of a report from the State Board of Health to the Governor and Legislature of Georgia, in the winter of 1876, in reference to the visitation of that year upon our immediate coast and connecting cities. I then said, and now say with equal confidence that, "For all practical purposes, it is not necessary to demonstrate whether yellow fever is always imported, or whether, under certain peculiar and exceptional circumstances, it arises upon our coast from local causes alone. That it can be imported, and will, or can become epidemic from the neglect of proper sanitary regulations in certain localities, will not be questioned. That it may be imported and not become epidemic, in the absence of the circumstances which favor its propagation, will also be admitted, without discussion. The very warm contest, therefore, which has been carried on for many years in regard to the exotic or local causes of yellow fever, does not seem to be justified by the necessities of the case, or the importance of arriving at conclusions of a definite character with reference to the possibility of excluding it altogether as an epidemic from our shores. Let the facts of importation or local origin, or of both, be as they may, no argument is needed to establish the proposition that no means of preventing the occurrence of yellow fever should be neglected, which could, by possibility, be brought into requisition.

The value of a properly regulated system of quarantine cannot be successfully controverted. The value of an enlightened and thorough system of internal sanitary regulations cannot be estimated. In both points of view, the facts developed in regard to the recent epidemic of yellow fever upon our coast is a sad commentary upon the wisdom and fidelity of both State and local authorities. Not being a statesman, and this not being the time or the occasion to discuss the question of Federal or State jurisdiction, which has excited some controversy of late, I will still venture to say that, if those States through whose borders the fell destroyer makes his incursions, continue to be insensible to the lamentations of widows and orphans, and the wreck of homes and fortune, I for one, would gladly welcome the intervention

of the paternal care of the general government in the effort to save the lives of the people, even though it be at the expense of a cherished political idea. The principles announced can, I conceive, provoke no heated discussion among enlightened and philanthropic men, and offers a platform of efficiency, in my judgment, broad enough and conservative enough for all practical sanitarians to stand upon, and the high ends indicated, to the accomplishment of which your aid is invoked, opens up a problem of life and death, of science, philanthropy and art, enough for any heart and brain.

Your annual convocations, running back for thirty years, have constantly illustrated the progress of medical science in all its departments, and you have held no more important meeting than the present. Our people give you a greeting commensurate with your grand mission and august character.

We are authorized, therefore, to cherish the hope that your deliberations and kindly intercourse at this session of your body will result in lasting consequences, destined to elevate medical science to a still higher level, and to increase public confidence in the claims of that dignified and humane calling, whose skilful and charitable contributions are so urgently demanded by the whole human family, from infancy to old age.

And now, in conclusion, I am sure that I can safely predict that the interests excited and the friendships formed here will be the last to be forgotten. What we lack in interest, we hope to make up by the heartiness with which we offer what we have.

Then, gentlemen of the American Medical Association, in the name of our people and the medical profession in this city, I again extend to you a thrice reiterated welcome to our State, our city, our homes, and our hearts.

He then presented the list of delegates and permanent members, which was read by the Permanent Secretary.

The entire list is as follows:—

ALABAMA.

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{	E. H. C. BAILEY,
{	PAUL DELACY BAKER,
{	WM. O. BALDWIN,
{	W. G. BIBB,
{	JAS. MARSHALL COLLIER,
{	CHAS. H. FRANKLIN,
{	JOHN P. FURNISS,
{	W. C. JACKSON,
{	R. F. MICHEL,
{	JOHN ALBERT PRITCHETT,
{	JAS. J. WINN.

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<i>Macon County Med. Society,</i>	{ CHAS. H. FORT, B. F. JOHNSON.
<i>Montgomery Med. and Surg. Soc.,</i>	WM. J. HOLT.
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<i>Permanent Members,</i>	{ J. A. DIBRELL, JR., D. H. DUNGAN.

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<i>Permanent Member,</i>	JOSEPH M. TONER.
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State Medical Society,{ J. T. BANKS,
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	{ ALBERT VANDERVEER.
<i>New York County Medical Soc.,</i>	{ WALTER R. GILLETTE,
	{ MONTROSE A. PALLAN.
<i>New York Academy of Medicine,</i>	L. DUNCAN BULKLEY.
<i>St. Lawrence County Medical Soc.,</i>	JESSE REYNOLDS.
<i>Permanent Members,</i>	{ A. N. BELL,
	{ M. H. BURTON,
	{ HERMAN KNAPP,
	{ LEWIS A. SAYRE,
	{ EDWARD SEGUIN.

NORTH CAROLINA.

<i>State Medical Society,</i>	{ FRANK DUFFY,
	{ EUGENE GRISSOM,
	{ THOMAS F. WOOD.
<i>Charlotte Academy of Medicine,</i>	J. M. MILLER.

OHIO.

<i>State Medical Society,</i>	{ W. W. DAWSON,
	{ STARLING LOVING,
	{ W. H. MUSSEY.
<i>Cincinnati Medical Society,</i>	{ JOHN A. MURPHY,
	{ E. WILLIAMS.
<i>Cincinnati Academy of Medicine,</i>	{ A. E. HEIGHWAY,
	{ THOS. WOOD.

<i>District Medical Society,</i>	CYRUS FALCONER.
<i>Delaware County Medical Soc.,</i>	A. E. WESTBROOK.
<i>Permanent Member,</i>	JONATHAN MORRIS.

PENNSYLVANIA.

<i>State Medical Society,</i>	{ SAMUEL D. GROSS, JAMES ROSS.
<i>Allegheny County Medical Soc.,</i>	{ SILAS N. BENHAM, JAMES KING, A. M. POLLOCK, G. M. SHILLITO.
<i>Fayette County Medical Society,</i>	S. BUTTERMORE.
<i>Lackawana County Med. Soc.,</i>	H. ISAAC JONES.
<i>Lancaster County Medical Society,</i>	JOHN K. LINEAWEAVER.
<i>Philadelphia County Med. Soc.,</i>	{ RICHARD A. CLEEMANN, ALBERT FRICKE, JOHN V. SHOEMAKER, ALBERT H. SMITH, FRANK WOODBURY.
<i>Permanent Members,</i>	{ WILLIAM B. ATKINSON, RICHARD J. DUNGLISON.

RHODE ISLAND.

<i>State Medical Society,</i>	{ CHAS. H. FISHER, JOB KENYON.
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SOUTH CAROLINA.

<i>State Medical Society,</i>	{ EDWARD WILLIAM AIKEN, J. P. CHAZAL, F. G. CROFT, C. H. LADD, J. FORD PRIOLEAU, F. PEYRE PORCHER, A. N. TALLEY, JOHN M. THOMPSON, E. B. TURNIPSEED, P. A. WILHITE.
<i>Columbus Medical Society,</i>	JOHN LYNCH.

TENNESSEE.

	{	A. BLITZ, WM. T. BRIGGS, J. A. DRAUGHON, DUNCAN EVE, W. T. HOPE, W. P. JONES, B. B. LENOIR,
<i>State Medical Society,</i>	{	THOMAS LIPSCOMB, THOMAS MENEES, J. D. PLUNKET, J. J. PULLIAM, DEERING J. ROBERTS, P. D. SIMS, H. JOS. WARMUTH, E. M. WIGHT.
<i>Davidson County Medical Soc.,</i>		JOHN B. W. NOWLIN.
<i>Hiwassee Medical Association,</i>		JOHN L. ATLEE.
<i>Knox County Medical Society,</i>	{	CHALMERS DEADERICK, J. P. PARK, A. B. TADLOCK.
<i>Loudon County Medical Society,</i>		JOSIAH J. HARRISON.
<i>Shelby County Medical Society,</i>	{	R. W. MITCHELL, A. H. VOORHIES.
<i>Permanent Members,</i>	{	JOHN M. BOYD, W. T. McREYNOLDS, FRED. PAINTER, J. H. VAN DEMAN.

TEXAS.

<i>State Medical Society,</i>	{	JAS. B. ADAIR, H. W. BROWN, J. B. WILLIS.
<i>Permanent Member,</i>		GREENSVILLE DOWELL.

VIRGINIA.

<i>State Medical Society,</i>	{	J. L. CABELL, J. EDGAR CHANCELLOR, LANDON B. EDWARDS, SAMUEL C. GLEAVES, J. MCD. MASSIE, ALBAN S. PAYNE.
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Norfolk City Medical Society,
Permanent Member,

HERBERT M. NASH.
JOSEPH S. TIPTON.

WISCONSIN.

State Medical Society,

{ JOHN K. BARTLETT,
D. F. BOUGHTON,
JOSEPH J. BROWN,
E. L. GRIFFIN,
GEO. W. JENKINS,
SOLON MARKS,
JAMES T. REEVE,
O. W. WIGHT.

UNITED STATES ARMY.

Medical Department,

{ JOHN S. BILLINGS,
W. H. FORWOOD,
R. M. O'REILLY,
J. J. WOODWARD.

UNITED STATES NAVY.

Medical Department,

{ ALBERT LEARY GIHON,
THOMAS J. TURNER.

He presented several protests against the registration of certain delegates and others, which were referred to the Judicial Council.

He offered the following for election as Members by Invitation; on motion they were elected:—

B. W. TOOLE, Talladega, Alabama; EDWARD CROSS, Little Rock, Arkansas; J. J. JONES, Jr., Little Rock, Ark.; R. N. ROSS, Lonoke, Ark.; L. B. ALEXANDER, Forsyth, Ga.; J. A. BEASLEY, West Point, Ga.; HORATIO N. HOLLIFIELD, Sandersville, Ga.; D. G. HUNT, Dalton, Ga.; R. H. JENKINS, Hogansville, Ga.; THOS. J. JONES, Hogansville, Ga.; ABRAM M. OWEN, Evansville, Ind.; J. P. ROSSER, Conyers, Ga.; GEORGE HOMAN, St. Louis, Mo.; C. H. H. SAYRE, New York City, N. Y.; JOSHUA C. WALKER, Wilmington, N. C.

He offered the following for election as Permanent Members; on motion they were elected:—

R. B. RIDLEY, Atlanta, Ga.; G. C. DUGAS, Augusta, Ga.; W. W.

EVANS, Oxford, Ga.; ROBERT C. EVE, Augusta, Ga.; A. W. GRIGGS, West Point, Ga.; W. J. HARRELL, Bainbridge, Ga.; J. M. JOHNSON, Atlanta, Ga.; J. B. ROBERTS, Sandersville, Ga.; THOS. R. WRIGHT, Augusta, Ga.

Dr. LOGAN presented invitations to a reception by the Governor at the Executive Mansion on Tuesday evening; to visit Stone Mountain; to a barbecue at Augusta; and to the various places of interest in Atlanta, which were, on motion, accepted, and thanks returned.

The Permanent Secretary read notes of regret at being prevented from attending the session from Dr. H. I. BOWDITCH, Boston, Mass.; Dr. H. R. STORER, Newport, R. I.; Dr. X. C. SCOTT, Cleveland, Ohio; Dr. J. C. HUTCHISON, Brooklyn, N. Y.; Dr. WM. LEE, Washington, D. C.

Vice-President Dr. A. J. FULLER having taken the chair, the President then delivered the Annual Address.

On motion of Dr. WM. BRODIE, of Michigan, the thanks of the Association were tendered to the President for his able and eloquent address, and a copy was requested for publication.

The vote was taken by rising and was unanimous.

On motion of Dr. J. P. LOGAN, of Georgia, the Ex-Presidents were invited to seats on the platform. Drs. S. D. GROSS, N. S. DAVIS, J. M. TONER, and T. G. RICHARDSON responded.

A volunteer paper by Dr. LEWIS A. SAYRE, of New York, entitled "Proofs of the Superiority of the Treatment of Spondylitis by Suspension and Retention in Improved Position by the Application of Plaster-of-Paris Bandage," was presented, and on motion was referred to the Section on Surgery and Anatomy.

The Permanent Secretary then read the report by Dr. E. SEGUIN, of New York, on the adoption of the Metric System.

On motion it was received and ordered to be entered on the minutes.

Mr. President and Confrères :—

I told you at our last meeting that the International Medical Congress of Geneva, acting upon the proposition of the American delegates, had appointed a commission to report at the International Medical Congress of Amsterdam upon the possible progress of uniformity in medicine and pharmacy—each commissary having to report for his nation. Now I ask you what shall be our share in this report?

The preliminary step towards International Uniformity in Medicine and Pharmacy is the adoption of the International

Metric System, now accepted by all the nations but two, this country and England.

In this country the metric agitation has been kept up by several publications, distributions of metres in all their forms, the action of Metric Bureaux and Medical Organizations; and the metric conversions of the last two years are too many to be all reported.

The Metric System has been applied to all the branches of the United States Marine Hospital Service, and has worked well from the start, a year ago.

The officers in charge of the vital statistics of New York, Boston, and other large cities, use the Metric System, and complain of being obliged to convert into metric figures the fantastic weights and measures of the documents emanating from our profession.

The Medical Society of the State of Pennsylvania at its session of June, 1878, passed resolutions urging the use of the Metric System upon its members, by the county societies, and that it be taught in the public schools.

The Delaware County Medical Society voted the same resolutions, including the one relating to the public schools.

The Medical Society of the State of Massachusetts has first of all, I believe, accepted the Metric System.

The Rhode Island State Medical Society has voted the same, to take effect January, 1880.

The Medical Society of the State of New York "requests of those who present papers at its future meetings that the Metric System be employed in their communications, and that this system be exclusively used in public proceedings of this society." (February 6, 1879.)

The Medical Society of the County of New York resolved (March 24, 1879), that "the Metric System shall henceforth be used in the minutes of this society, and in all the papers published under its authority."

The Medical Society of Kings County, after hearing a paper of Dr. Edward Seguin on the use of the Metric System in medicine, and the necessity of organizing a Metric league, "appointed (March 18, 1879) a committee to consider these recommendations and report."

The Georgia Medical Society of Savannah "takes pleasure in giving their moral support to the adoption of the Metric System by the American Medical Association, and will put this system in practice in their city (Savannah, April 23, 1879).

I can recite the text of forty similar adhesions to the use of the Metric System in medicine, but prefer to close these quotations by the terse expression of Dr. F. Morse, secretary of the Kansas Medical Society: "We approve of the Metric System, but we wait for the example of other States." This word contains in its kernel all the "internal" question of weights and measures.

As for the "foreign" question: (2) On one hand the invitation of the International Medical Congress to join the other nations in a plan of "Uniformity Medical and Metric" is a precious opportunity to do brotherly what we should have to do soon on moral compulsion.

On another hand, England, whose stubbornness is partly responsible for our own supineness in this matter, begins to shake herself up.

The London *Lancet* of November 23, 1878, gives a formal adhesion to the use of the Metric System in medicine; and in its issue of February 1, 1879, expatiates on "the very great boon which would accrue to the medical profession by the introduction of Metric Weights and Measures, and by the abandonment of the grotesque and obsolete system which is now in vogue."

And the talented editor of the *British Medical Journal* wrote to me (February 4, 1879, London): "I hope I may be able to excite sufficient interest on the subject here to bring about practical measures. I shall be aided by your progress, and I shall be glad to hear details; and shall you come to our Cork meeting, to bring tidings of Metric progress?"

The significance of this letter resides in the fact that the *British Medical Journal* is the organ of the British Medical Association.

Altogether, these public and private documents are warnings for the American Medical Association to accept the Metric System before the next meeting of the British Medical Association; no nobler rivalry than this being possible between England and this Republic. Considering that foremost in human interest is the uniformity of weights in prescriptions, which would prevent the grave or fatal results attending the composition abroad of medicine prescribed here; and the uniformity of measures which would give the possibility of writing observations uniform—that is to say, comparable at sight—with those of other nations. Then considering the possibility of mathematically accounting for the vital functions intrusted to the physician, in health at first, during their waste in disease, and in the course of their recuperation under treatment: and to make these individual records serve as mathematical elements of true medical statistics. Considering also—from a domestic point of view—that it is the duty of this Association to lessen and shorten the dangers inherent to the transition of one system of measures and weights to another; and that it will be highly creditable for this Association to have brought to bear all its latent force on such an important issue, I submit to you the following resolutions:—

Resolved, 1. That the American Medical Association adopts the International Metric System, and will use it in its transactions.

2. Requests that those who present papers at its future meet-

ings employ this system in their communications, or reprints thereof.

3. Requests the medical boards of the hospitals and dispensaries to adopt the Metric System in prescribing and recording cases; and that the Faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments.

4. Requests the physicians familiar with the Metric System to help their confrères and the druggists in its application; and the delegates present at this session, to work up the acceptance of the Metric System by their respective County and State societies.

5. Requests our President to name a Metric Executive Committee, of which he shall be the ex-officio Chairman, and whose task will be to give unity and rapidity to this Metric movement.

After some discussion, on motion of Dr. MONTROSE A. PALLEN, of New York, the consideration of the resolutions attached was postponed until the session of Thursday.

Dr. A. N. BELL, of New York, having called up the amendment offered by him at the last meeting, on motion it was unanimously adopted.

Amend the By-Laws, Section II., to consolidate Sections 4 and 5, and call the new section, SECTION 4, on Medical Jurisprudence, Chemistry, Psychology, State Medicine, and Public Hygiene.

Dr. SAMUEL LILLY, of New Jersey, presented a question as to membership in this body, which was referred to the Judicial Council.

Dr. IRWIN KELLER, of Kentucky, called up the amendment to the plan of organization as offered last year by Dr. JAS. M. KELLER, and moved its adoption, but after some discussion the motion was withdrawn.

The Permanent Secretary read the following report of the Judicial Council in reference to the registration of the delegates from the Arkansas Medical Association:—

Resolved, That we do not regard the delegates from the Arkansas State Medical Association as entitled to registration, because we do not recognize the Society they represent as a State Society, but without prejudice to the professional standing and character of the individual delegates.

Allen County Medical Society of Indiana.

Resolved, That all matter pertaining to the Allen County Medical Society of Indiana be postponed until the next annual meeting of the Judicial Council.

S. N. BENHAM,
Secretary of the Judicial Council.

On motion, the Association adjourned to meet on Wednesday, May 7th, at 9½ A.M.

SECOND DAY.

WEDNESDAY, May 7.

The President called the Association to order at 9½ A.M.

The Chairman of the Committee of Arrangements offered lists of candidates for permanent membership and membership by invitation.

On motion they were elected.

The following telegram was presented and read by the Permanent Secretary:—

COLUMBUS, OHIO, May 6, 1879.

President American Medical Association:—

Dr. Norton's bill providing material for dissection passed the Ohio House to-day.

J. A. NORTON.

On motion, the Permanent Secretary was directed to send Dr. NORTON the congratulations of this body.

The Permanent Secretary read the following:—

The Judicial Council would report that it is in possession of information whereby Dr. W. H. MYERS, of Indiana, has forfeited his membership as permanent member of the American Medical Association.

The papers referred to the Council from the Medical Society of the City of Wheeling and County of Ohio concerning Dr. HUPP were referred to that Society for adjudication.

An invitation to visit and use the rooms of the Young Men's Library of Atlanta was received, and on motion of Dr. J. F. HIBBERD, of Indiana, the thanks of the Association were tendered for the same.

Dr. J. T. REEVE, the Secretary of the Section on State Medicine, etc., reported as follows:—

A paper read before this Section by Dr. S. E. CHAILLE, on "State Medical Societies and State Medicine," being esteemed one of general interest, is referred to the Association with the recommendation that it be read before the Association in general session.

On motion, the communication was referred to the Committee of Arrangements to select an appropriate time.

The following communication from the Section on State Medi-

cine, etc., was read by the Permanent Secretary, and on motion unanimously adopted:—

The Section on State Medicine and Public Hygiene respectfully presents to the Association the following resolutions relative to the death of the late Dr. WILLIAM M. COMPTON.

J. T. REEVE,
Secretary.

ATLANTA, GA., May 7, 1879.

Whereas: Dr. WILLIAM McCORKLE COMPTON, of Holly Springs, Mississippi, a distinguished practitioner of medicine, late the Medical Superintendent of the asylum for the insane in his State, a permanent member of the American Medical Association, and the President of its Section of Psychology and Medical Jurisprudence, has been removed by death from the scenes of his labors and usefulness, it is, by this Section, unanimously

Resolved, That we deeply deplore the untimely death, from yellow fever, of our distinguished co-laborer in medical and psychological science and the official head of one of its Sections:

That we heartily tender to his orphan children and bereaved friends our sincere sympathy in their sorrow, and,

That we mourn with the people of Mississippi, their loss of an intelligent, self-denying and useful citizen.

Resolved, That these resolutions be reported to the American Medical Association, with the request, that they be referred to its Committee on Necrology.

EUGENE GRISSOM,
FOSTER PRATT,
J. M. TONER.

A volunteer paper, entitled "A New Ecraseur for the removal of Uterine Tumors," was offered, and, on motion, was referred to the Section on Surgery and Anatomy.

On motion of Dr. JOHN BROWNRIGG, of Mississippi, it was

Resolved, That, out of respect to the memory of Lieut. BENNER, who volunteered from this military post to take command of the Mississippi River Relief Expedition, the Commanding Officer of the United States force here be invited to a seat in this Association.

On motion of Dr. A. C. POST, of New York, it was

Resolved, That there be published five thousand copies of the Address of President PARVIN to be distributed *pro rata* to the members.

Dr. ALBERT FRICKE, of Pennsylvania, presented the following resolutions which had been adopted by the Philadelphia County Medical Society.

On motion, they were laid on the table.

PHILADELPHIA, April 29, 1879.

At the last business meeting, April 23d, of the Philadelphia County Medical Society, the inclosed preamble and resolution was passed, and forwarded to the chairman of the delegation to the American Medical Association by the Recording Secretary, with instruction to present the same to the Association meeting at Atlanta, Ga., May 6th.

ALBERT FRICKE,
Chairman.

Whereas, A constant supply of pure quinine is a matter of vital importance to this country, and

Whereas, Under a moderate protective tariff its manufacture in the United States has been placed upon a firm basis, thus furnishing the profession and the public with an article of superior purity to the imported, free from the grave risk of an interrupted supply, and

Whereas, A removal of protection would probably result in the total destruction of this industry, leaving us at the mercy and caprice of foreign governments in this most important particular; therefore

Resolved, That the delegation of this Society to the American Medical Association be and is hereby instructed to use its best efforts to obtain the passage of a resolution requesting the Congress of the United States to make no change in the law regulating the duty on this valuable alkaloid or its salts.

On motion of Dr. DEERING J. ROBERTS, of Tennessee, it was

Resolved, That this Association reiterates its request to the Congress of the United States that the duty upon the alkaloids of Cinchona be removed.

Dr. THOMAS F. ROCHESTER, of New York, Chairman of the Section on Practice of Medicine, Materia Medica, and Physiology, delivered his address.

On motion, it was referred to that Section.

Vice-President Dr. JOHN MORRIS took the chair.

Dr. J. J. WOODWARD, U. S. Army, read the Address of Dr. JOHN S. BILLINGS, U. S. Army, Chairman of the Committee on "State Medicine and Public Hygiene." Dr. BILLINGS, though in attendance, was too ill to read his address.

On motion, the address was referred to the appropriate Section.

On motion, General FRANCIS A. WALKER, Superintendent of the Census, was invited to a seat on the platform.

President, Dr. T. PARVIN, in the chair.

Dr. N. S. DAVIS, of Illinois, read the report on the recommendations in the Address of Dr. T. G. RICHARDSON, delivered at the last meeting.

Report of the Committee on the Address of the President of the Association at the Meeting in Buffalo, June 4, 1878.

The undersigned having been appointed a Committee at the last meeting of the Association to take into consideration the questions discussed by the President, T. G. RICHARDSON, in his Annual Address, beg leave to report

That, while there are several important suggestions offered by the President for improving the efficiency of the Association, and awakening the profession in general to their duty with reference to State Medicine, they desire to call especial attention to the plan proposed for the encouragement of original investigation by a change in the present rules concerning prize essays. They are convinced that such a change would develop much deeper interest in original work, add largely to the honor of successful competition, and result in the production of essays of the highest value to the profession. In accordance with the views expressed in the Address, they, therefore, respectfully recommend the following alterations of the By-Laws.

1. Expunge from Section III. everything relating to Prize Essays, and the Committee on Prize Essays.

2. Introduce into Section II. the following laws:—

Prize Essays.

a. There shall be four annual prizes of two hundred and fifty dollars each, which shall be awarded at the close of the second year after announcement, as hereinafter explained, for strictly original contributions to medical and surgical progress.

b. It shall be the duty of the chairman of each of the following four Sections: 1. Practical Medicine, Materia Medica, and Physiology; 2. Obstetrics and Diseases of Women and Children; 3. Surgery and Anatomy; 4. State Medicine and Public Hygiene, to appoint annually before the adjournment of the meeting of the Association three members of ability and good judgment, who shall constitute a Committee of Selection, and who shall, within thirty days thereafter, select and publicly announce for competitive investigation and report, a subject belonging to one or other of the branches of medicine included in the title of the Section.

c. It shall also be the duty of the chairman of each of the Sections mentioned to appoint annually a Committee of Award, consisting of three experts, who shall carefully examine the essays offered for competition, and if any one shall be found worthy of the prize as a substantial contribution to medical knowledge, to recommend the same to the Association.

d. All essays placed by their authors for competition shall be in the hands of the chairman of the respective Committees of Award on or before the first day of January preceding the meeting of the Association at which the reports of the committees are required to be made.

e. All Prize Essays shall be considered as the property of the Association.

f. The names of the authors of the competing essays shall be kept secret from the committees by such means as the latter may provide.

g. Membership in either of the two committees shall not debar from membership in the other; nor shall membership in the Committee of Selection exclude a member from the privilege of offering a competing essay.

N. S. DAVIS, }
S. D. GROSS, } *Committee.*
J. M. TONER, }

On motion, the report was accepted, and as the attached resolution required an alteration of the By-Laws, they were laid over as an amendment until next year.

Dr. IRWIN KELLER, of Kentucky, again called up the amendment of Dr. J. KELLER, as follows:—

Plan of organization, Art. IV., Sect. 1. In future the Committee on Nominations shall present the name of no person for appointment or election to office or position save on the Committees on Necrology and Climatology, unless the party nominated be in attendance on the Association at the time.

After some discussion, on motion of Dr. E. GRISSOM, of North Carolina, the amendment was laid on the table.

The following amendment offered by Dr. H. O. HITCHCOCK, of Michigan, was read, and on motion of Dr. DUDLEY S. REYNOLDS, of Kentucky, was laid on the table.

Plan of organization, Art. IV., Sect. 1. The several State, Army, and Navy delegations, including delegates and permanent members, shall, on the first day of the Annual Meeting of this Association, at a meeting publicly called for that purpose, nominate candidates for the several offices of President, Vice Presidents, and Chairman for the several Sections, and shall choose one of their number to act on the Nominating Committee of the Association, with power to cast as many votes in that Nominating Committee as there are members of the delegation of which he is a member. Candidates for the several offices above named to be reported to the Association shall be selected from the names reported to the Committee of the several State delegations.

The amendment offered by Dr. J. J. CALDWELL, of Maryland, as follows, was on motion of Dr. WM. BRODIE, of Michigan, laid on the table.

By-Laws, II. Sections. Form an additional Section, to be known as the Section on Neurology and Electrology.

The amendment offered by Dr. T. CLAY MADDUX, of Maryland, was called up:—

By-Laws, II. Sections. Form an additional Section on Diseases of the Genito-Urinary Organs, including Syphilis and Dermatology.

A motion to lay it on the table was negatived. After much discussion, on motion of Dr. FOSTER PRATT, of Michigan, it was referred to the Section on Surgery and Anatomy for a report to-morrow as to the admissibility of the change.

The amendment to the Code of Ethics, as offered by a committee at last meeting, was then called up:—

“Code of Ethics,” Art. I., paragraph I., add “And hence it is considered derogatory to the interests of the public and the honor of the profession, for any physician or teacher to aid, in any way, the medical teaching or graduation of persons knowing them to be supporters and intended practitioners of some irregular and exclusive system of medicine.”

Dr. E. S. DUNSTER, of Michigan, spoke at some length in opposition.

Dr. N. S. DAVIS explained his relation to the amendment.

Dr. FOSTER PRATT moved, in view of the fact that the attendance at this session was small, and there was not an opportunity to discuss the matter, that it lie over until next session.

Dr. W. BRODIE moved to lay this motion on the table, which was negatived, and Dr. PRATT's motion was adopted.

A recess was now taken to allow of the selection by the States of their members of the Committee on Nominations.

The Permanent Secretary announced the Committee as follows:—

Alabama, WM. O. BALDWIN; Arkansas, R. G. JENNINGS; California, R. BEVERLY COLE; Connecticut, C. W. CHAMBERLAIN; Delaware, C. H. RICHARDS; District of Columbia, J. M. TONER; Florida, J. P. WALL; Georgia, C. G. CRAWFORD; Illinois, H. A. JOHNSON; Indiana, JAS. F. HIBBERD; Iowa, H. B. RANSOM; Kansas, C. V. MOTTRAM; Kentucky, DUDLEY S. REYNOLDS; Louisiana, E. S. LEWIS; Maine, T. J. ESTABROOK; Maryland, THOS. B. EVANS; Massachusetts, L. F. WARNER; Michigan, J. H. JEROME; Minnesota, J. H. MURPHY; Mississippi, E. PAUL SALE; Missouri, A. B. SLOAN; New Jersey, SAMUEL LILLY; New York, M. A. PALLAN; North Carolina, EUGENE GRISSOM; Ohio, W. H. MUSSEY; Pennsylvania, SAMUEL D. GROSS; Rhode Island, C.

H. FISHER; South Carolina, F. PEYRE PORCHER; Tennessee, J. D. PLUNKET; Texas, H. W. BROWN; Virginia, ALBAN S. PAYNE; Wisconsin, S. MARKS; United States Army, W. H. FORWOOD; United States Navy, THOMAS J. TURNER.

On motion, the Association adjourned until Thursday at 9½ A. M.

THIRD DAY.

THURSDAY, May 8.

The President called the Association to order at 9½ A.M.

Dr. LOGAN, Chairman of the Committee of Arrangements, presented a list of candidates for membership by invitation, etc.

On motion they were elected.

He presented and had read the following communication:—

ATLANTA, May 7, 1879.

DR. J. P. LOGAN:—

DEAR SIR: In June, 1877, the American Medical Association adopted resolutions asking for free sulphate of quinia.

This article is largely made in the United States and a great deal of capital is invested in the business.

At the meeting in 1877, American manufacturers had no opportunity to show why the duty should remain as at present.

I have come from Philadelphia to Atlanta to ask for a hearing on behalf of the Quinine makers of this country, and trust that you will use your influence to secure me an opportunity to explain why we cannot continue to produce Quinine if the duty should be removed.

On East India barks we pay 10 per cent. duty.

On alcohol we pay a tax of about \$1.70 per gallon.

Another solvent we used is dutiable \$2 per gallon, if imported, and if of American manufacture, costs us double what it did prior to the imposition of a tax on distilled spirits.

English and other European quinine makers have *all* of their crude materials free. We have only *one*, namely, South American barks; everything else is either subject to customs duties or internal tax.

It becomes then a question whether or not the Association desires to have sulph. quinia produced in this country.

A vast amount of misrepresentation is current concerning the manufacturers of quinine, and I will refer to one recently published as an illustration.

It is stated in the papers of this and last week, and published everywhere as a "Washington item," that there is only *one* quinine establishment.

Now, there are *four*; two in Philadelphia and two in New York, while there are but two in England. It is further stated that the removal of the duty will relieve the people of the payment of not less than 150 per cent. which they pay more for the drug than they would were it free.

Now, quinine in England has averaged 12 shillings per ounce, or say \$3 there so far this year.

150 per cent. added would give \$7.50 as the price of the American according to this newspaper statement.

Our highest price, this year, has been \$3.60, and most of our contracts were made at \$3.40 per ounce.

The duty on quinine sulphate is 20 per cent., which is a low rate, considering the taxation on our crude materials, and it is far below the average rate imposed on other forms of manufactured goods and agricultural products, many of which are produced from free crude materials.

Respectfully,

A. H. JONES.

For POWERS & WEIGHTMAN, Philadelphia.

“ ROSENGARTEN & SONS, “

“ C. T. WHITE & Co., New York.

The following from the Section on State Medicine, etc., was unanimously adopted:—

The Section on State Medicine and Public Hygiene has by vote adopted the following resolution in reference to the paper of Dr. J. S. BILLINGS.

J. T. REEVE,

ATLANTA, GA., May 7, 1879.

Secretary.

Resolved, That the Section of State Medicine and Public Hygiene recognizes the great importance of the co-operation of the medical profession in securing statistics of disease and of mortality referred to in the address of Dr. BILLINGS, and that it fully endorses such plans referred to in said address, and the Section recommends to the American Medical Association the adoption of the following preamble and resolution:—

Whereas, The Superintendent of the Census requests that the physicians of the United States will aid him in making the Mortality and Morbidity Statistics of the Census of 1880 as complete as possible;

And whereas, It is of the highest importance to medical science and to public hygiene that this request shall be fully and universally complied with; therefore, be it

Resolved, That the American Medical Association earnestly recommends to each and every physician in the United States that he shall furnish such information as is requested by the Superintendent of the Census, and that he shall keep such a record of his cases for the year beginning June 1st, 1879, as will enable him to make this information accurate and reliable.

The Permanent Secretary read the following, which, on motion, was referred to the Judicial Council:—

DALTON, GA., May 7, 1879.

Mr. President and Gentlemen of the Convention:—

Regretting I am not present with you enjoying, as I am sure I should, a magnificent literary and scientific treat in a "Feast of reason and a flow of soul," my heart is with you, and although I have long since retired from the practice of the profession of my choice I still feel an abiding interest in whatever tends to elevate and dignify it, and equally ready with the best of my feeble ability, to fight against any and every attempt to bring discredit upon so noble a profession. Therefore I wish to bring to your notice a most mortifying and disgraceful transaction which I am satisfied is continually occurring, in one instance of which the most indisputable evidence is before me. This transaction is rendered still more disgraceful and the more mortifying from the circumstances surrounding it, which naturally gives cause for sneers to be thrown at us from our neighbors across the water. As much and as justly as we may point with pride at the many American physicians who have attained the highest round in the ladder of fame, yet it is lamentably but too true that from some fault (I don't pretend to say at whose door it lies) the profession of medicine in the United States is being continually brought into disgrace. (True this case is not of our own school, yet abroad they go under the name of M.D.s.)

I report this, not that such things are unknown to you, but in the hope that something may be done to check this trying evil. Is there no way to prevent this imposition upon the people, to say nothing of the material injury thus inflicted by these unprincipled swindlers upon the true medical profession? So indignant am I—and must every true man become—that were I to write all I feel my letter would become, perhaps, too long to meet with any attention. I will therefore state as briefly as possible what the matter is.

An acquaintance of mine, but recently arrived in the United States from England, made a wager that he could buy the degree of M.D. without attending lectures, or even studying medicine. He therefore secured, as an assistant in doing so, an accomplice in the person of an M.D.(?) an Alumnus of a certain *Concern*—I will not say college or university—in Philadelphia to *vouch* for him. With this new-fledged M.D.'s certificate he sent \$40 to the above concern at Philadelphia, and received in return *by mail* a fine, showy parchment diploma, all printed in Latin, "*secundem artem*," from the "*Facultas Universitatis Americanæ, apud Philadelphiam*," testifying that the applicant (whose name for obvious reasons I withhold and call John Smith) had matriculated, attended regularly and diligently *two* full courses of lectures, and being found proficient in all the branches of medi-

cine, surgery, and midwifery, they conferred upon him this diploma and the degree of Doctor of Medicine, and signed: "Wm. Baird, President; Geo. H. Kitchen, M.D.; John Buchanan, M.D., Prof. Pract. Med.; J. J. Viggins, M.D., Prof. Anatomy; R. A. Simpson, M.D., Prof. Mat. Med. and Ther.; John Watson, M.D., Prof. Surgery; D. Dillon, M.D., Prof. Obstet. and Diseases of Women and Children; John Thompson, M.D., Prof. Chemistry. Given at the University at Philadelphia, on June 10th, 1876." The applicant then being not only not at Philadelphia, but not even in Pennsylvania, but at a small town in Tennessee, and had never seen one of the above Professors(?) or M.D.s(?); nor any of these halls, lecture-rooms, or buildings of any kind, and not even knowing if they had any at all.

In addition to this diploma he also received a larger and more showy one for Clinics, reading: "Know all men, etc., that this diploma is awarded to 'John Smith' for meritorious attendance upon the Clinical Lectures of University Hospital. Therefore, we, President, Board of Managers, Superintendent, Physician, Surgeon, and Obstetrician, do hereby certify that 'John Smith,' a graduate of medicine, has attended *two full terms* at said Hospital. In testimony whereof we have set our names and the seal of the University, this 10th day of June, 1876. Signed: Geo. A. Kitchen, M.D., President; John Wilson, M.D., Secretary; John J. Liggim, M.D., Surgeon; John Buchanan, M.D., Physician; D. Dillon, M.D., Obstetrician."

He received still another diploma from the "National Eclectic Medical Association," certifying that "John Smith, M.D." had been faithfully and rigidly examined by the Censors of this Association, and found eminently qualified in the arts of medicine, surgery, and obstetrics, thoroughly progressive, and holding a high and honorable position in the profession, and having been approved by the Executive Committee, is admitted a member of this association, and entitled to all its rights and privileges. "In testimony," etc., they "award this diploma" (24 x 30 inches, and *very imposing* (?)) and signed: "John Buchanan, M.D., President; John Liggim, M.D., Secretary; Geo. H. Kitchen, M.D., John Watson, M.D., D. Diller, M.D., Censors." And another, smaller and less pretentious, awarding him a high place among the distinguished alumni, signed: "John Buchanan, M.D., President; John J. Liggim, M.D., Secretary; Geo. H. Kitchen, M.D., John Watson, M.D., Censors."

The applicant assures me he never saw nor knew any of the above persons, and that he obtained this all through the mails. I hope I have not wearied your patience, but thought that while you were now in session I could not refrain mentioning to you such a formidable array of diplomas as now lies before me, all worthless. Wishing you success, harmony, happiness, and the accomplishment of much good,

I am yours, fraternally,

W. C. BELLAMY.

Dr. N. S. DAVIS read the report on Ozone, which, on motion was referred to the Committee of Publication, and the resolutions attached were unanimously adopted.

Report of the Committee appointed to confer with the Superintendent of the Signal Service Bureau of the U. S. Government relative to the addition of daily observations concerning the Electric and Ozonic conditions of the atmosphere to the items at present included in the meteorological records made at the several stations in that service; and such other matters as the committee might deem important.

In accordance with the instructions of the Association at its last annual meeting, your committee presented a communication to General Meyer, Superintendent of the Signal Service Bureau, inquiring into the practicability of having the electric and ozonic conditions of the atmosphere added to the meteorological items recorded at the several signal service stations, and a personal interview was also obtained by two members of the committee. The propositions of the committee were most respectfully considered, and a disposition manifested to render the work of the bureau as useful as possible in the advancement of medical investigations.

Yet, the Superintendent was not willing to attempt the proposed additional records until the Association or its committee could point out more definitely the best methods of making the proposed observations and the best instruments for the purpose. After a careful consideration of the whole subject, your committee knowing the object in view, to be the advancement of our knowledge concerning the exact relations between the conditions and qualities of the atmosphere and the prevalence of disease; and that such advancement could not be made without both clinical and meteorological records running parallel in the same localities; has thought it best to make the following brief suggestions for the considerations of the Association.

First. It must be obvious to every thoughtful student of medical history, and especially to those who have given any attention to the department of etiology, that we can never fully solve the many vitally important problems connected with the origin, progress, spread, and disappearance of diseases, whether endemic or epidemic, until we can have, continuous through a series of years, two parallel series of carefully observed and recorded facts. One in regard to the date of beginning of attacks of all acute diseases; the other in regard to all appreciable conditions as qualities of the atmosphere. Both series must be made in the same localities and for the same periods of time.

The localities should be sufficiently numerous and distant from each other to embrace several places liable to frequent invasion of epidemics; some more subject to endemics; and others in more healthy districts. In no department of human knowledge

are the questions presented for solution more complex, that is, involving the consideration of a greater number of elements than in those relating to the causation of disease. Consequently in no department of investigation is there a greater tendency to show conclusions from insufficient data, and to mistake mere coincidences for causes. We cannot investigate fully the causes of a single epidemic without a full knowledge of the topography of the localities in which it prevails; the habits and sanitary condition of the people affected by it; a complete record of all appreciable conditions and qualities of the atmosphere before, during, and after the epidemic; and the commercial or other connections of the infected locality, with other parts of the world. Neither is it sufficient to have this completeness of knowledge for a single year or in reference to a single epidemic, but it should extend through several years and embrace more than one prevalence of the same epidemic disease.

Even if it should be fully ascertained that the special cause or specific infection producing any given epidemic form of disease was an exotic, acting only when imported, still so strong are the evidences that such infection must have local conditions favorable for its increase and spread, that for all practical purposes it becomes necessary to determine the nature of such local conditions as the nature of the specific infection itself.

Second. For the reasons just stated your committee respectfully suggest that a beginning might be made in the right direction, if in a limited number of judiciously selected localities, some properly qualified physician could be engaged to observe and record the electric and ozonic condition of the atmosphere faithfully by having the instruments and materials of uniform and reliable character furnished for the purpose; and in each of these localities from one to six active practitioners could be induced to record the beginning of all attacks of acute disease coming under their observation; and all these parties required to return the full results of their respective observations at stated periods to a central committee, whose duty it should be to obtain from the Signal Service Bureau copies of their meteorological records in the same places, and carefully compare and tabulate these several records, the most valuable results could be obtained in a small compass and reported to the proper Sections of this Association every year. If the working of the plan proved successful, the number of stations, or localities, and the number of observers could be increased from year to year, until they included a fair representation of every part of our country, and we should have on record so complete a statement of carefully observed facts in regard to the local and meteorological conditions through a series of years, that all our investigations concerning the causes, conditions of spread, and consequent means for prevention of all the more important diseases, would be greatly facilitated with increased certainty of accurate results. It is believed that the

most reliable instruments and means for the use of the electric and ozonic observers could be obtained through the Smithsonian Institution at a small expense, and that the execution of the whole plan would require but a small appropriation from the treasury of this Association annually. By enlisting the attention and co-operation of State and local medical societies in the same work, it would result in more rapidly advancing, not only our knowledge of the causes of disease and the conditions modifying their operation, but also the vitally important interests of Sanitary science.

Your committee would therefore respectfully recommend the adoption of the following resolution by this Association:—

Resolved, That a committee of five be appointed by the President, whose duty it shall be to investigate the practicability of carrying into active operation the foregoing plan of observations, the cost of the instruments and means required, the twelve best localities in which to begin the work, and whether the required number of qualified observers can be secured in each, and report the same for the consideration of this Association at its next annual meeting.

Respectfully submitted,

N. S. DAVIS, <i>Chairman</i> ,	} <i>Committee.</i>
J. M. TONER,	
J. S. BILLINGS,	
S. M. BEMISS,	
W. H. GEDDINGS,	

The report on American Medical Necrology was presented by Dr. J. M. TONER, District of Columbia, and together with memorials of those physicians who had died of yellow fever during the recent epidemic, was referred to the Committee of Publication.

The Permanent Secretary read the following from the Committee on Sanitaria. On motion, the committee was continued with the addition of Dr. WM. PEPPER.

APRIL 11, 1879.

DEAR DR. ATKINSON: I have heard from the majority of the Committee on Sanitaria, which should report to the American Medical Association, and the gentlemen consent to my request that the committee should be continued another year. This is requested in order to be able to make a complete report, which it would be impossible to make at the next meeting. It has been suggested, moreover, that Dr. Pepper having been employed by a wealthy Philadelphia firm to gather facts similar to those we should have had to collect, and with whom we have co-operated during the past year, should be added to our committee.

Will you see to these two points, as I shall be unable (much

to my regret) to be present? A few weeks since I fell and lacerated the rectus femoris, and shall be wholly unable to travel at the time of the meeting.

Yours truly,
HENRY I. BOWDITCH.

The following communication from the Committee on National Medical Library was read, accepted, and the committee continued:—

This Association having for several years urged upon Congress, through a special committee, the publication of the Index Catalogue of the Library of the Surgeon-General's Office at Washington, it is gratifying to have to report that at length Congress has made an appropriation and ordered the printing of the first two volumes of this valuable work. While congratulating ourselves at this auspicious beginning, we must not forget that other volumes must be provided for, and that to this end we recommend that this Association should continue through a committee and by its members, to urge upon Congress to appropriate means for completing and printing this valuable work.

It is also desirable that Congress should provide a sufficient number of copies of the "Index Catalogue" to supply them to the principal medical libraries, and also to the leading medical writers and teachers not only in this country but in Europe.

Respectfully submitted,
J. M. TONER,
For Committee.

Dr. J. J. WOODWARD, of the United States Army, returned thanks to the Association on behalf of his colleagues for the efforts of this Association.

Dr. Wm. B. ATKINSON, of Pennsylvania, then presented the report of the Committee of Publication, which was accepted and ordered to be entered in the minutes.

PHILADELPHIA, May 6, 1879.

The Committee of Publication beg leave to report that all the copy for the volume of Transactions referred to them by the Sections, sub-committees, and the Association itself at the session of 1878, was placed in the hands of the printer immediately after the adjournment of the Association.

The volume, which includes the "Prize Essays," was pushed forward as rapidly as was commensurate with the delays incident to the forwarding to and return of proofs from authors, and the careful preparation of the numerous and valuable illustrations. The edition amounted to 1300 copies.

As, hitherto, much delay has been caused by the inability to decide the edition because of the tardiness of the permanent members in forwarding their subscriptions, your committee de-

terminated to inaugurate a new method in the hope of avoiding this obstacle, and at their suggestion, the Treasurer early in this year issued his call for the subscription for 1879. The success of this movement remains to be seen.

Your committee congratulate the Association upon the fact that the present volume, the 29th, is one of the most valuable of the series.

The increased bulk of the volume necessitated its being distributed other than through the mails, in some cases causing delay in delivery.

As the new postal law admits of the carrying by the mails of books regardless of weight, in the future we shall be able to send out the volumes without difficulty.

From the origin of this Association it has been, as with similar bodies, the rule, in no case to distribute the extra copies of scientific papers to their authors prior to the completion of the volume. Nor does your committee see any valid reason for a departure from this rule.

WM. B. ATKINSON,
Chairman.

The Treasurer presented his annual report, showing a balance in the treasury of \$1245.66.

On motion it was accepted and referred for publication.

The report of the Librarian, Dr. WM. LEE, of the District of Columbia, was read by the Permanent Secretary, and, on motion, accepted and referred to the Committee of Publication.

On motion, the amount of one hundred dollars asked for was allowed.

Vice-President, Dr. JOHN H. MURPHY, in the Chair.

Dr. S. E. CHAILLE, of Louisiana, read his paper on State Medical Societies, etc.

On motion it was referred to the Section on State Medicine.

President PARVIN, in the chair.

Dr. MOSES GUNN, of Illinois, Chairman of the Section on Surgery and Anatomy, read his address.

On motion, the address was referred to the appropriate Section.

Vice-President, Dr. A. J. FULLER, in the chair.

Dr. SAMUEL D. GROSS, of Pennsylvania, Chairman of the Committee on Nominations, presented a partial report, which was unanimously accepted.

PRESIDENT.

Dr. LEWIS A. SAYRE, *of New York.*

VICE-PRESIDENTS.

1. Dr. R. BEVERLY COLE, *of California.*
2. Dr. E. M. HUNT, *of New Jersey.*
3. Dr. H. O. MARCY, *of Massachusetts.*
4. Dr. F. PEYRE PORCHER, *of South Carolina.*

TREASURER.

Dr. RICHARD J. DUNGLISON, *of Pennsylvania.*

LIBRARIAN.

Dr. WILLIAM LEE, *of District of Columbia.*

COMMITTEE ON LIBRARY.

Dr. JOHNSON ELIOT, *of District of Columbia.*

ASSISTANT SECRETARY.

Dr. WALTER R. GILLETTE, *of New York.*

Next place of meeting.—New York City.

Committee of Arrangements.—Drs. S. O. VANDERPOOL, Chairman; STEPHEN SMITH, WM. M. POLK, ROBERT F. WEIR, CHAS. INSLEE PARDEE, A. A. SMITH, T. A. SABINE, *of New York City*; Dr. JOSEPH HUTCHISON, *of Brooklyn*; Dr. M. H. BURTON, *of Troy*; Dr. EDWARD H. PARKER, *of Poughkeepsie.*

Committee on Publication.—Drs. W. B. ATKINSON, T. M. DRYSDALE, ALBERT FRICKE, SAMUEL D. GROSS, CASPAR WISTER, R. J. DUNGLISON, *of Pennsylvania*; WM. LEE, *District of Columbia.*

The Committee also report the following nominations for Chairmen and Secretaries of Sections for 1880 :—

1. Practice of Medicine, Materia Medica and Physiology—Dr. J. S. LYNCH, *of Maryland*, Chairman; Dr. W. C. GLASGOW, *of Missouri*, Secretary.

2. Obstetrics and Diseases of Women and Children—Dr. ALBERT H. SMITH, *of Pennsylvania*, Chairman; Dr. ROBERT BATTEY, *of Georgia*, Secretary.

3. Surgery and Anatomy—Dr. W. T. BRIGGS, *of Tennessee*, Chairman; Dr. C. POWELL ADAMS, *of Minnesota*, Secretary.

4. State Medicine, Public Hygiene, Medical Jurisprudence, Chemistry and Psychology—Dr. JAMES F. HIBBERD, *of Indiana*, Chairman; Dr. THOS. F. WOOD, *of North Carolina*, Secretary.

5. Ophthalmology, Otology and Laryngology—Dr. BOLLING A. POPE, of Louisiana, Chairman; Dr. EUGENE SMITH, of Michigan, Secretary.

Committee on Necrology.—Drs. J. M. TONER, of the District of Columbia, Chairman; R. F. MICHEL, of Alabama; E. W. HATCH, of California; JNO. B. CUMMINGS, of Arkansas; CHAS. DENISON, of Colorado; G. W. RUSSELL, of Connecticut; J. P. WALL, of Florida; C. H. RICHARDS, of Delaware; T. S. HOPKINS, of Georgia; J. H. HOLLISTER, of Illinois; G. L. SUTTON, of Indiana; H. B. RANSOM, of Iowa; C. V. MOTTRAM, of Kansas; DUDLEY S. REYNOLDS, of Kentucky; E. S. LEWIS, of Louisiana; E. F. SANGER, of Maine; JNO. MORRIS, of Maryland; L. F. WARNER, of Massachusetts; G. E. RANNEY, of Michigan; D. W. HAND, of Minnesota; JNO. BROWNRIGG, of Mississippi; J. M. RICHMOND, of Missouri; JOHN BLACK, of Nebraska; L. G. HILL, of New Hampshire; H. D. DIDAMA, of New York; JNO. BLAINE, of New Jersey; F. I. HAYWOOD, Jr., of North Carolina; STARLING LOVING, of Ohio; FRANK WOODBURY, of Pennsylvania; C. H. FISHER, of Rhode Island; MANNING SIMONS, of South Carolina; J. BERRIEN LINDSLEY, of Tennessee; H. W. BROWN, of Texas; O. F. FASSETT, of Vermont; L. S. JOYNES, of Virginia; R. W. HAZLETT, of West Virginia; J. T. REEVE, of Wisconsin; J. J. WOODWARD, U. S. Army; A. L. GIHON, U. S. Navy.

Dr. E. S. LEWIS, of Louisiana, Chairman of the Section on Obstetrics and Diseases of Women and Children, read his address. On motion it was referred to the appropriate Section.

The resolutions relative to the Metric System as offered by Dr. E. SEGUIN, of New York, and postponed till to-day, were then read and adopted unanimously:—

Resolved 1. That the American Medical Association adopts the International Metric System, and will use it in its transactions.

2. Requests that those who present papers at its future meetings employ this system in their communications, or reprints thereof.

3. Requests the medical boards of the hospitals and dispensaries to adopt the Metric System in prescribing and recording cases; and that the Faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments.

4. Requests the physicians familiar with the Metric System to help their confrères and the druggists in its application; and the delegates present at this session, to work up the acceptance of the Metric System by their respective County and State societies.

5. Requests our President to name a Metric Executive Committee, of which he shall be the ex-officio Chairman, and whose task will be to give unity and rapidity to this Metric movement.

On motion of Dr. S. E. CHAILLE, of Louisiana, it was

Resolved, That the President and Secretary of this Association are directed to annually petition Congress to enact a law which shall permit every person engaged in a scientific pursuit to import for his own use, free of duty, any one book or instrument appertaining to his special pursuit.

Resolved, That the above-named officers are further directed to urge the State Medical Societies and their auxiliary branches to aid this Association in accomplishing this purpose, by petitions to Congress, and by otherwise influencing Congressmen.

Dr. WM. BRODIE, of Michigan, offered the following, which, on motion, was referred to the Judicial Council:—

Whereas, Of late years many drugs and combinations of drugs bearing copyright names have been placed on the market, and especially introduced to the notice of physicians, and

Whereas, Such drugs and combination of drugs having copyrighted names are advocated in the medical journals of the country, be it

Resolved, That the use of articles thus protected by copyright, and the promoting of their use by advertising them in medical journals, is a distinct violation of *Section 4*, of Article I. of that portion of the Code of Ethics treating “of the duties of physicians to each other and to the profession at large,” and also of *Section 4*, Article I. of that portion of the Code of Ethics treating “of the duties of the profession to the public, and of the obligations of the public to the profession.”

Dr. JOHN H. RAUCH, of Illinois, offered the following amendment to the Constitution, which was laid over until next year under the rule:—

Amendment to the Constitution—

Article II., second paragraph, after “Army and Navy” insert “and the Marine Hospital Service of the United States.”

Article II., fourth paragraph, at the end insert “the Marine Hospital Service of the United States shall be entitled to one delegate.”

Dr. E. B. TURNIPSEED, of South Carolina, offered the following, which was, on motion, referred to the Section on Obstetrics:—

Resolved, That out of the Sections on Surgery and Anatomy, and Obstetrics, there be formed a Section to examine, deliberate upon, and decide the merits or demerits of all surgical and gynæ-

cological instruments presented to either of the first-mentioned Sections, and that the President of this Association, between the adjournment of this meeting and the next annual meeting of this Association do appoint from the members of this Association, to serve on this new Section, a number of *only* those who are inventors and have some reputation as such.

On motion, the Association adjourned, to meet on Friday at 9½ A.M.

FOURTH DAY.

FRIDAY, May 8.

The President called the Association to order at 9½ A.M.

He announced as the Committee on Ozone: Drs. N. S. DAVIS, of Illinois; J. M. TONER, of District of Columbia; S. M. BEMIS, of Louisiana; W. H. GEDDINGS, of South Carolina; H. O. MARCY, of Massachusetts.

As the Committee on the Metric System: Drs. THEOPHILUS PARVIN, of Indiana, ex-officio Chairman; EDW. SEGUIN, of New York; E. WIGGLESWORTH, of Massachusetts; J. R. WEIST, of Indiana; E. R. SQUIBB, of New York.

On motion, Drs. E. C. CROSS, R. N. ROSS, and J. J. JONES, Jr., of Arkansas, were made members by invitation.

The Permanent Secretary read the report of Dr. W. H. DALY, of Pennsylvania, of the Delegation to Foreign Societies.

On motion, it was accepted and referred to the Committee of Publication.

To the President and Members of the American Medical Association.

The following named delegates attended the 46th annual meeting of the British Medical Association, which met in Bath, England, August 6th, 7th, 8th and 9th, 1878.

Drs. J. MARION SIMS, of New York; J. J. M. ANGEAR, of Iowa; H. T. CLEAVER, of Iowa; W. H. PANCOAST, of Pennsylvania; W. H. DALY, of Pennsylvania.

At a meeting of the delegates, at the Royal Hotel, Bath, an organization was effected by making J. MARION SIMS, Chairman, and W. H. DALY, Secretary. Through the latter the following report is respectfully offered:—

The British Medical Association is seventeen years the senior of the American Medical Association.

It has 7500 members, an annual income of \$55,000, and an average annual attendance of about 500 at its general meetings.

They began publishing a daily journal at their annual meetings in 1867, which is to all intents and purposes, a daily directory

for use of members and delegates in attendance, and is considered an indispensable convenience, informing them of the time for meeting, the order of business for the day, the time and localities of the Section meetings, and what may be expected to be heard and seen there.

In the same year the sectional meetings were established, and these are still continued much in the same manner as in our own Association.

At Bath, the experiment of having the meetings of the Sections in other than the building where the general meetings were held, was tried and found to work without disadvantage, notwithstanding the distance of separation was fully half a mile.

The first day was devoted to registration of the delegates and members, and the evening to the delivery of the president's address, by R. N. Falconer, of Bath. The subject dwelt upon was the history of Bath, her thermal springs and their therapeutic value.

The glory of Bath, as a watering place, has however departed.

The address in surgery by C. G. Wheelhouse, of Leeds, was an event in the meeting which attracted attention. It bore indisputable evidence that the provincial cities of Great Britain, were quite abreast, if not in advance, of the better known profession of the great Metropolis of London.

The terse style and lucid manner of delivery of Mr. Wheelhouse, were unexcelled by any speaker at the meeting. In fact the American-like character of the English used by the speaker was conspicuous to the American ear. He was listened to by all with the most marked attention and most general approval.

The empirical practice of former times was compared to the wide and accurate range of the modern surgical art.

The bloodless surgery of Esmarch, of Kiel, and the antiseptic practice of Lister, were highly spoken of, without altogether committing himself to the theories involved in the latter gentleman's doctrine, further than to say, "but for antiseptic surgery many of his patients would have lost their limbs, and some of them their lives also."

Physiological rest was advocated in surgery of the bladder, by cutting as for lithotomy, in cases of ulceration of that organ. The practice had been sufficiently tested by the speaker and his colleagues to enable him to speak encouragingly of it.

His unqualified preference was given for the old time silk cord, over all other ligatures of modern invention, and a thorough division of the inner and middle coats of the vessel in its application.

A high tribute was paid to Dr. Louis A. Sayre, of New York, and an acknowledgment gracefully made to that gentleman's ingenuity and earnestness in mechanical and orthopædic surgery: he felt justified in saying that no one, at least in Great Britain, had ever suggested the application of the plaster of Paris jackets for

treatment of spinal curvature, until that gentleman had demonstrated its application at the Manchester meeting one year before.

The treatment of encapsulated nævi as practised by Mr. Teale, was described as being comparatively bloodless, by means of a ligature, first carried subcutaneously around the subjacent tissues of the nævus, then a careful dissection made of the mass; in many cases leaving the skin, thereby preventing an extensive cicatricial deformity.

While honored pioneers in surgery were being passed in review and their triumphs justly lauded, the names of Wells and Keith were applauded to the echo. It there seemed strange to the American that Ephraim McDowell's name was omitted in so comprehensive an address: "verily the disciples are greater than the master."

But not the least interesting of this excellent address was a case in the practice of Mr. Wheelhouse, that of a man, who was admitted to the Leeds Infirmary, with the object of having his leg amputated.

The limb was withered, powerless, and without sensation; the result of a division of the sciatic nerve, by falling upon a scythe. Ordinary means were exhausted in trying to restore the limb, when Mr. Wheelhouse conceived the idea of cutting down in the cicatrix and seeking to reunite the divided nerve. This was done, and the ends which were found fully two inches apart, imbedded in cicatricial tissue, were pared down obliquely until healthy nerve fibre was reached; they were then united by finely prepared catgut suture, and traction upon the reunited nerve prevented by flexing the leg and dressing it in that position. A cure was accomplished, sensation and motion returned, with strength in the limb, and the patient became an active farm hand, as before the accident.

Mr. Callender's address in the Surgical Section upon the avoidance of pain was the natural outgrowth of the ingenuity with which his wards at St. Bartholomew's Hospital are constantly conducted. It was well received as a reminder of what every surgeon should endeavor to do for the comfort of his patients after operations.

Dr. McClintock, of Dublin, in the Obstetrical Section, gave in an address the results of his own investigations, as well as those of Matthews Duncan and others, as to the rate of mortality of women in childbed, and placed it at about 1 in 105 during the four weeks after labor.

The address in the Medical Section by Mr. Granger Stewart, on some morbid states of the kidney, treated chiefly of those in post scarlatinal dropsy and puerperal eclampsia. Of the pathology of the cirrhotic kidney he held the opinion that the disease was inflammatory.

The question of women members came up for discussion in the general meeting, and was put before the meeting in the follow-

ing proposition: "That no female be eligible as a member of the Association." Two women members were already present at the meeting, and one of them, Mrs. Garrett Anderson, of London, a woman of ability, was evidently going to speak her mind upon the subject, which in course of debate she did, and gave decided evidence that, being in the Association, she would not abandon it, but would remain and fight the battle for women. While the subsequent vote went against the admission of women, it does not act retrospectively, and therefore leaves those who have been admitted by the branch societies still members of the British Medical Association, who are favorable to the admission of more women, and under the leadership of the genial and able advocate, Dr. Burchardt, of Manchester, the question will be fought over and over at the annual meetings, with the probable result, however, of not only keeping out other women but putting out those who are already in.

The capacity of the average Englishman for getting rid of what he considers a bad bargain is unlimited, and the ways and means are devious and insidious, therefore the result of the women question in the profession of Great Britain is a foregone conclusion.

Dr. H. T. Cleaver, a co-delegate from Iowa, notes the following: In the Obstetrical Section the discussion of Stenosis of the Cervix was participated in by J. Marion Sims, Bennet, Smith, and others, and was chiefly interesting on account of the approved criticism of Sims upon the use of the metrotome. His black-board demonstrations before the Section, illustrating his method of treatment of this common source of dysmenorrhœa and sterility, struck a chord of such unanimous acquiescence that when the allotted time for each had been more than triplicated, the desire was still for more from the man who stands the acknowledged prince in American gynæcological surgery. As an American, Dr. Cleaver felt that his country had been honored, and the standing of the profession in America exalted by his simple and unassuming demonstration of valuable truths.

In the Medicine Section the subject of Intestinal Obstruction was discussed by Jonathan Hutchinson, Long, Fox, Broadbent, and others.

Dr. Fotherick, of Wolverhampton, gave an important point in clinical experience not new to the American observer, that of a case of intestinal obstruction, where he had injected a large quantity of sweet oil into the rectum, the patient being upon his hands and knees. Oil was vomited after the enema; that it was the same oil that was injected there could be no doubt, as the only article that could be obtained was used, and was unmistakably rancid and easily recognized and identified. The important experiments and valuable teachings of Dr. Robert Battey, of Georgia, seemed not to be known to any of the surgeons present. A remark by Jonathan Hutchinson upon the novelties mentioned

by a speaker, of matters injected into the rectum being vomited by the mouth confirmed this belief.

Dr. J. Milner Fothergill, of London, a well-known author in America, read an able paper upon the subject of "Gout at the Heart," which suggested the possibility that many cases diagnosed angina pectoris might, upon deeper investigation, be found to depend upon gout affecting that organ.

Mr. Lennox Browne, of London, in the Surgical Section, read a paper upon "Varieties of Obstructed Nasal Respiration; its Causes, Symptoms, and Treatment." His decided preference for the use of the galvanic cautery in removing hypertrophied tissues from the naso-pharyngeal passages was expressed as being the least painful, the quickest, and safest.

The kindness and hospitality of the profession was unostentatious but remarkably efficient. Dining and other entertainments are conducted with ceremony and indulged in most generally; in fact dining is a fine art with them, bountifully provided for at the meetings.

Your delegation was most kindly received and courteously treated, and we would fain express the hope that our meetings could be so arranged for time and season, as to insure a delegation each year from the British Medical Association. This could be done by holding our meetings at the last of August or 1st of October, and some of the many watering places could be selected just before the close of the season; there is then less occupation for the medical man, and time to spare to go to meetings, and there is then a need for a trip which every man feels. The spring meetings come so close to the meetings of the State medical societies that many attend only one who would, under the plan suggested, attend both.

While the British medical man is our superior in all that pertains to patient training and investigation, the American is far in advance in general adaptability and efficiency in detail in the every-day work of his profession, therefore the mingling of the two would redound to the advantage of both, and a better understanding both nationally and individually, result from the coming together of the profession of both nations.

Respectfully submitted,

W. H. DALY,

Secretary of Delegation.

The following communication was received from the Section on Surgery and Anatomy:—

Secretary American Medical Association:—

The motion to divide the Section of Surgery and Anatomy and create a new one made by Dr. MADDUX, of Maryland, and referred to the Section of Surgery and Anatomy for recommendation, was duly considered by the Section. After some discussion,

clearly indicating that the majority of the Section were opposed to such division, Dr. MADDUX withdrew his motion, after which there was no further action in the matter.

Respectfully,

J. R. WEIST, *Secretary*.

The following communication from the Section on State Medicine, etc., was read:—

The Section on State Medicine and Public Hygiene, having approved the following resolutions offered by Dr. CHAILLE, recommend their passage by the American Medical Association.

Resolved, That a Standing Committee on the more efficient organization of this Association and its branches, consisting of five members, be appointed by the president.

Resolved, That this committee be instructed to devise and recommend ways and means to secure greater uniformity, as well as greater strength of organization of the State Medical Societies, and of their auxiliary branches.

That among these ways and means the following be considered:

1. The compilation of a model code of detailed regulations for the government of State and County Medical Societies.

2. The requirement from every State Medical Society of an annual report to contain certain data, to be specified, and necessary to show the condition and progress of each of these State Societies, and of their auxiliary branches, to also contain a brief summary of the peculiarities of its organization, and of the measures being used by it to promote medical organization; and, still further, to contain a brief summary of the laws of the State in reference to State medicine, and of the efforts being made to promote the practice of State medicine. Such reports should be published in the annual Transactions of each society.

3. The publication in the annual Transactions of the Association of a consolidated report of the above reports from each State, together with special notice of the meritorious work done by any of the branches of this Association.

4. The substitution of a periodical medical journal for the present annual volume of Transactions.

5. The non-recognition by this Association of State Societies, which make no provisions encouraging the organization of auxiliary societies in counties, etc.

6. The advisability of electing no person, either a permanent member or a member by invitation, unless such person be a member of a State Medical Society; provided that there be such a society recognized by this Association in his State.

7. The advisability of refusing to admit to this Association delegates from societies auxiliary to a State Society, unless the certificates of delegation be endorsed by an authorized officer of the State Society.

8. The advisability of refusing to admit any delegates, except

those selected from and elected only by voting members who have paid all fees due to their respective County and State Societies; and of establishing the principle that only those members of branch societies who are entitled to vote and have paid all fees due will be entitled to delegates.

9. The advisability of urging every medical college to have not less than one lecture delivered to every graduating class on the importance to the profession and to the people of medical organization.

On motion of Dr. F. PRATT, the word "standing" was stricken out from the first resolution.

On motion of Dr. N. S. DAVIS, the resolutions were adopted.

The following communication from the State Board of Health of California, was read and ordered to be entered on the minutes.

SACRAMENTO, April 25, 1879.

To the President and Members of the American Medical Association.

GENTLEMEN: At a regular meeting of the State Board of Health of California, held on the 18th inst., I was directed to transmit to your honorable body the following resolution:—

Resolved, That the State Board of Health of California, being unable to send a delegate to the American Medical Association, to meet in May, 1879, fully recognizing the importance of a National Board of Health, desire to convey to the said Association the hope that the efforts which have hitherto been made by that body will continue to be exerted until that important object has been fully and satisfactorily accomplished.

Very truly yours,

F. W. HATCH,
Secretary of State Board of Health.

The following communication from the Committee on "Intervention of Physicians in Education," was read, and the committee was continued:—

NEW YORK, April 28, 1879.

W. B. ATKINSON, M. D.,
Secretary American Medical Association.

DEAR SIR: I beg leave to inform you that the committee appointed at the last meeting of the American Medical Association, to report on Dr. Seguin's paper on the "Intervention of the Physician in Education," will not be prepared to report at the forthcoming meeting, owing to unavoidable circumstances.

The magnitude of the subject, the consideration given to it by Educational Institutions, the extensive correspondence called forth, and the contemplated action of the authorities connected with public instruction in relation to the hygienic management of schools, and the satisfactory, though incomplete results so far attained, have induced the committee to request that the presen-

tation of the final report be deferred until the next meeting of the Association, when, it is hoped, that the result of the labors of the committee will prove satisfactory.

Very respectfully yours,

R. J. O'SULLIVAN, M.D.,
Chairman.

The Permanent Secretary read the following appointments by the President:—

Delegates to foreign organizations:—Drs. J. M. DA COSTA, of Pennsylvania; E. SEGUIN, of New York; L. P. YANDELL, of Kentucky; MOSES GUNN, of Illinois; J. T. HODGEN, of Missouri; EDWARD WARREN, of France; LAURENCE TURNBULL, of Pennsylvania; LEWIS A. SAYRE, of New York.

Delegates to the Canadian Medical Association:—Drs. J. C. HUTCHISON, of New York; WM. BRODIE, of Michigan; J. H. BLANKS, of Mississippi.

As the Committee on the resolutions of Dr. CHAILLE on State Medical Societies:—S. E. CHAILLE, of Louisiana; S. D. GROSS, of Pennsylvania; N. S. DAVIS, of Illinois; A. N. BELL, of New York; ALONZO GARCELON, of Maine.

By request of Dr. CHAILLE he was excused and Dr. FOSTER PRATT, of Michigan, was appointed.

The several Sections reported their minutes, and, with the accompanying papers, were referred to the Committee of Publication.

The Committee on Nominations presented their final report, which on motion of Dr. BRODIE, was accepted:—

Time of meeting, first Tuesday in June, 1880.

Committee on Prize Essays:—Drs. AUSTIN FLINT, Sr., Chairman, ALFRED C. POST, JOSEPH C. HUTCHISON, J. W. S. GOULEY, MONT-ROSE A. PALLAN, New York.

Members of Section on State Medicine, Public Hygiene, etc.:—Drs. W. H. HAWKINS, of Arkansas; JEROME COCHRANE, of Alabama; W. F. CHEENEY, of California; CHAS. DENISON, of Colorado; C. A. LINDSLEY, of Connecticut; WM. MARSHALL, of Delaware; THOS. ANTISELL, District of Columbia; J. P. WALL, of Florida; J. P. LOGAN, of Georgia; H. A. JOHNSON, of Illinois; JAMES F. HIBBERD, of Indiana; J. A. BLANCHARD, of Iowa; D. W. STORMONT, of Kansas; S. BRANDEIS, of Kentucky; STANFORD E. CHAILLE, of Louisiana; A. P. SNOW, of Maine; T. B. EVANS, of Maryland; H. I. BOWDITCH, of Massachusetts;

H. B. BAKER, of Michigan; C. N. HEWETT, of Minnesota; WIRT JOHNSTON, of Mississippi; A. J. STEELE, of Missouri; JOHN BLACK, of Nebraska; G. P. CONN, of New Hampshire; D. C. ENGLISH, of New Jersey; A. N. BELL, of New York; J. C. WALKER, of North Carolina; J. C. REEVE, of Ohio; H. CARPENTER, of Oregon; BENJAMIN LEE, of Pennsylvania; E. M. SNOW, of Rhode Island; R. A. KINLOCK, of South Carolina; T. A. ATCHESON, of Tennessee; H. W. BROWN, of Texas; F. D. CUNNINGHAM, of Virginia; L. C. BUTLER, of Vermont; E. A. HILDRETH, of West Virginia; J. T. REEVE, of Wisconsin; JOSEPH R. SMITH, U.S.A.; A. L. GIBON, U.S.N.

Judicial Council:—In place of the seven whose terms expire at this meeting: Drs. W. O. BALDWIN, of Alabama; N. S. DAVIS, of Illinois; JNO. P. GRAY, of New York; E. L. HOWARD, of Maryland; A. N. TALLEY, of South Carolina; D. W. STORMONT, of Kansas; JOSEPH P. LOGAN, of Georgia.

All of which is respectfully submitted,

S. D. GROSS, *Chairman*,

EUGENE GRISSOM, *Secretary*.

The Committee also submit the following resolutions, and ask your concurrence:—

Resolved, That the Committee of Publication be instructed to advertise for proposals to publish the Transactions of this Association in six of the largest cities of the Union, and that the contract be awarded to the lowest and best responsible bidder.

Resolved, That the Treasurer be instructed to deposit the funds of the American Medical Association monthly in the name of the Association in the Farmers' and Mechanics' Bank of Philadelphia.

On motion of Dr. PRATT, the officers were unanimously elected.

Dr. A. M. POLLOCK moved to lay the first resolution on the table, which was negatived.

Dr. PRATT moved to strike out the words "six largest cities," which was negatived.

On motion, the resolution was adopted.

Dr. BRODIE moved to lay the second resolution on the table. This was negatived.

On motion of Dr. DUNSTER, the words "as Treasurer" were inserted, and the resolution was then adopted.

On motion of Dr. EUGENE GRISSOM, the Permanent Secretary was voted an honorarium for his services of six hundred dollars.

On motion of Dr. TONER, it was agreed "if so much money be in the Treasury after paying the running expenses."

Vice-President Dr. MURPHY in the chair.

Dr. H. KNAPP, of New York, Chairman of the Section on Ophthalmology, Otology, and Laryngology, read his address.

On motion, it was referred to the Committee of Publication.

President, Dr. PARVIN, in the chair.

The Committee on Prize Essays reported as follows:—

The Committee on Prize Essays beg leave to report that they have had submitted to them two Essays for the prizes of the Association. One entitled "A consideration of certain forms of primary and (local) secondary degeneration of the lateral columns of the spinal cord, with especial reference to an infantile rare form," and bearing the motto "In utrusque paratus," which they deem entirely worthy of a prize. The committee therefore recommend that a prize of one hundred dollars be awarded to the author of this Essay. The second Essay entitled "Explorations in Physiology," having the motto, "Nature speaks to us in a peculiar language," etc., the committee are disposed to commend, but they are of opinion that it does not come up fully to the standard erected by the Association for prize essays; they therefore recommend that the second prize be withheld.

ROBERT BATTEY, *Chairman*,
HENRY F. CAMPBELL,
WM. ABRAM LOVE.
J. H. VANDEMAN,
R. B. RIDLEY.

On motion the report was received and the Essay referred to the Committee of Publication.

The Permanent Secretary broke the seal and announced that the successful essayist was Dr. ALLAN McLANE HAMILTON, of New York.

Dr. N. S. DAVIS offered the following which were unanimously adopted:—

Resolved, That the cordial thanks of this Association are hereby tendered to the several railroad companies in different parts of the United States for their liberality in the commutation of fare over their several routes of travel to and from the present place of meeting.

Resolved, That the thanks of the Association are tendered to the local press for the kindly and accurate attentions it has given to our proceedings.

Resolved, That the most cordial thanks of this Association are hereby tendered to our retiring President, not only for the able and impartial manner in which he has discharged his official

duties, but also for the truly eloquent and noble sentiments uttered in his learned address.

Resolved, That the sincere thanks of this Association are hereby tendered to the Local Committee of Arrangements, and to the Permanent Secretary for the efficient manner in which they have discharged their official duties, and for the excellent accommodations furnished for all the business and social purposes of our present meeting.

Resolved, That the sincere and heartfelt thanks of every member of this Association are tendered to the Governor of the State of Georgia; to the Mayor of the city of Atlanta, and to all of her citizens, whether professional or otherwise, for the bounteous and elegant hospitality so heartily extended to us during our stay in this Queen city of the empire State of the South.

Dr. W. BRODIE reported as follows, which on motion was accepted:—

Mr. President and Gentlemen: The undersigned, in behalf of the delegates from this body to the Canadian Medical Society, respectfully reports, that Dr. ———, and himself attended the late annual meeting at Hamilton, Ontario, and were received with the courtesies usually extended from one great association to another. We were much interested in their work and the able discussions had thereon, in which we were invited to take a part.

We would recommend that the pleasant relationship be continued of the appointment of delegates to attend their next meeting, to be held in London, Ontario, in September next.

W. BRODIE,
Chairman.

Dr. ATKINSON, presented the following, which was accepted:—

The Committee on State Boards of Health, who are required to report annually the results of their efforts, state that they addressed the usual memorial to the executives of the States still without State Boards of Health, and were assured by some of the executives that they would use their efforts to the desired end. They are happy to announce that the legislature of the State of Delaware has adopted such an Act, and the Board of that State is now in progress of organization.

We now have twenty State Boards, viz., in Alabama, California, Colorado, Connecticut, Delaware, Georgia, Illinois, Kentucky, Louisiana, Massachusetts, Maryland, Michigan, Minnesota, Missouri, New Jersey, North Carolina, Rhode Island, Tennessee, Virginia, and Wisconsin.

All of which is respectfully submitted,
WM. B. ATKINSON.

The Judicial Council made a final report, as follows:—

Is a gentleman who is not in affiliation with a County, District, or State Medical Society, where such organizations exist, entitled to be registered as a permanent member upon the claim of having been a delegate from a body not now entitled to representation in this body?

The above was offered by Dr. LILLY, of New Jersey, and referred to the Judicial Council.

The question was considered by the Judicial Council, and unanimously decided to be answered in the negative.

N. S. DAVIS,
President of Council.
S. N. BENHAM,
Secretary.

ATLANTA, May 9, 1879.

The President, Dr. PARVIN, then took leave of the Association, thanking the members, etc., and introduced his successor, Dr. LEWIS A. SAYRE, of New York, President elect, who took the chair with some appropriate remarks.

Dr. PARVIN then declared the meeting adjourned until the first Tuesday of June, 1880.

WM. B. ATKINSON,
Permanent Secretary.

MINUTES OF THE JUDICIAL COUNCIL.

THE Judicial Council of the American Medical Association met May 6th, 1879, at Atlanta, Ga.

The members present were Drs. N. S. DAVIS, Ill., Dr. D. A. LINTHICUM, Ark., S. N. BENHAM, Pa., J. H. VAN DEMAN, Tenn., J. M. TONER, D. C., J. K. BARTLETT, Wis., E. L. HOWARD, Md., FOSTER PRATT, Mich., J. P. LOGAN, Ga., S. LILLY, N. J., E. GRISSOM, N. C., A. N. TALLEY, S. C., and W. O. BALDWIN, Ala.

On motion, Dr. N. S. DAVIS, of Ill., was elected Chairman, and Dr. S. N. BENHAM, of Pa., Secretary.

Dr. TONER moved that the Secretary be instructed to purchase a book for the purpose of keeping the minutes of the Judicial Council properly recorded; carried, and Dr. BENHAM was instructed in accordance with the above motion, to purchase a book for that purpose.

A motion was made by Dr. TONER that Drs. DAVIS, PRATT, and GRISSOM be appointed a committee to draft rules and regulations for the government of the Judicial Council. Carried.

Dr. GRISSOM moved that the Secretary report to the Association that the Judicial Council is in possession of information that W. H. MYERS, of Ind., has forfeited his membership as a permanent member of this Association. ("See Paper No. 1, 1879.") Carried.

Dr. DAVIS moved that the paper, marked "No. 2, 1879," from the Medical Society of the city of Wheeling, and county of Ohio, be returned to that Society, as the Judicial Council could take no notice of the matter until final action had been taken by their own body. Carried.

On motion, the Council adjourned until 5 o'clock P. M., May 7th, 1879.

May 7th. The Council reassembled at 5 o'clock P. M.; members present, Drs. DAVIS, BALDWIN, LINTHICUM, LOGAN, TALLEY, BARTLETT, PRATT, GRISSOM, VAN DEMAN, LILLY, TONER, HOWARD, and BENHAM.

On motion of Dr. GRISSOM, seven members constituted a quorum for the transaction of business.

Dr. BARTLETT moved that an affirmative vote of two-thirds of the members present is necessary for a judicial decision; carried.

The communication from the Allen County Medical Society of Indiana (*see* "Papers Nos. 3 and 4, 1879") was read, and on motion of Dr. GRISSOM, the consideration of the same was postponed until the next meeting of the Council, that the Constitution and By-Laws of the Association might be examined upon that subject. Carried.

A protest from the Arkansas State Medical Society (*see* "Paper No. 5, 1879") was then read, and, after considerable discussion by Drs. DAVIS, PRATT, TONER, BENHAM, GRISSOM, LOGAN, and others, Dr. PRATT offered the following:—

Resolved, That the American Medical Association will receive delegates from but one State Medical Society in any State, such State Society to control—subject to the laws of the American Medical Association—all county and local Medical Societies within its geographical limits. Carried.

Dr. HOWARD then offered the following:—

Resolved, That the case of the Arkansas Medical Societies be considered the special order of business to-morrow at 5 o'clock P. M., and that all those claiming admission from the Societies, and whose claims are contested, be notified by the Secretary to be present. Carried.

Dr. HOWARD moved that charges presented in "Paper No. 6, 1879," be referred to the authors, with the suggestion that they present the same to the local or State Society to which the parties belong. Carried.

A committee, consisting of Drs. DAVIS, HOWARD, and PRATT, was appointed to collate whatever there is in the Constitution and By-Laws relating to the retention of permanent membership in the Association. Adjourned.

The Council again met at 5 o'clock P. M., May 8th, 1879; members present, Drs. DAVIS, LILLY, BALDWIN, PRATT, TONER, GRISSOM, BARTLETT, LINTHICUM, and BENHAM. On motion of Dr. PRATT, Dr. LINTHICUM, at his own request, was permitted to withdraw from the Council pending its discussion and decision in the matter of the Arkansas Societies.

The Judicial Council then proceeded to consider the subject-matter in "Papers Nos. 5 and 6, 1879." The following resolution

was then offered by Dr. BARTLETT, after hearing testimony in the above from Dr. DIBRELL, Jr.

Resolved, That we do not regard the delegates from the Arkansas State Medical Association as entitled to registration, because we do not recognize the Society they represent as a State Society; but without prejudice to the professional standing and character of the individual delegates elected. Carried.

The communication marked "Nos. 3 and 4" was then taken up, and, after discussion, Dr. PRATT moved that all matter pertaining to the Allen County Medical Society for adjudication be postponed until the next annual meeting of the Judicial Council. Carried.

Dr. LILLY then presented the following question: "Is a gentleman who is not in affiliation with a County, District, or State Society, when such organization exists, entitled to register as a permanent member upon the claim that he has been a delegate from a body not now entitled to representation in this body?"

On motion of Dr. VAN DEMAN, the question was answered in the negative.

The Council then adjourned to meet at the call of the President.

Members of the Judicial Council.

1880.	1881.	1882.
J. K. BARTLETT, Wis.	S. N. BENHAM, Pa.	W. O. BALDWIN, Ala.
F. STAPLES, Minn.	J. M. TONER, D. C.	N. S. DAVIS, Ill.
E. GRISSOM, N. C.	D. A. LINTHICUM, Ark.	JOHN P. GRAY, N. Y.
W. S. ROBERTSON, Iowa.	FOSTER PRATT, Mich.	E. L. HOWARD, Md.
S. LILLY, N. J.	A. WOODWARD, Conn.	A. N. TALLEY, S. C.
WM. M. MCPHEETERS, Mo.	J. H. VAN DEMAN, Tenn.	D. W. STORMONT, Kan.
A. F. WOODWARD, Vt.	R. N. TODD, Ind.	JOSEPH P. LOGAN, Ind.

S. N. BENHAM, M.D.,
Secretary Judicial Council.

STATEMENT OF COMMITTEE OF PUBLICATION.

Statement of Volumes of Transactions delivered and remaining on hand, April 25, 1879.

						On hand at last statement, and since received.	Delivered.	Remaining on hand April 25, 1879.
Volume	I.	1848	.	.	.	8	—	8
"	II.	1849	.	.	.	9	—	9
"	III.	1850	.	.	.	8	—	8
"	IV.	1851	.	.	.	6	1	5
"	V.	1852	.	.	.	39	3	36
"	VI.	1853	.	.	.	7	2	5
"	VII.	1854	.	.	.	7	—	7
"	VIII.	1855	.	.	.	40	4	36
"	IX.	1856	.	.	.	39	3	36
"	X.	1857	.	.	.	41	5	36
"	XI.	1858	.	.	.	40	4	36
"	XII.	1859	.	.	.	38	5	33
"	XIII.	1860	.	.	.	41	10	31
"	XIV.	1863	.	.	.	38	5	33
"	XV.	1864	.	.	.	37	4	33
"	XVI.	1865	.	.	.	40	6	34
"	XVII.	1866	.	.	.	39	5	34
"	XVIII.	1867	.	.	.	14	2	12
"	XIX.	1868	.	.	.	7	—	7
"	XX.	1869	.	.	.	4	—	4
"	XXI.	1870	.	.	.	5	1	4
"	XXII.	1871	.	.	.	31	3	28
"	XXIII.	1872	.	.	.	77	5	72
"	XXIV.	1873	.	.	.	91	7	84
"	XXV.	1874	.	.	.	8	1	7
"	XXVI.	1875	.	.	.	8	2	6
"	XXVII.	{ 1876 8					2	6
		{ Prize Essay 35					8	27
"	XXVIII.	1877	.	.	.	155	112	43
Proceedings	.	.	.	.	.	7	—	7

Volume XXIX., 1878—

Printed	.	.	.	.	.	.	.	1300
Delivered to date	.	.	.	.	.	.	.	1101
On hand	.	.	.	.	.	.	.	199

REPORT OF THE TREASURER.

THE Treasurer has the honor to report that the balance in the treasury at the date of this meeting is \$1245.66. The volume of Transactions for last year was one of the largest ever published by the Association, and the expense of its publication was materially increased by the addition of the Prize Essay, with its extensive tabular arrangement. The plan adopted after consultation of the Treasurer with the Committee of Publication, by which payment of dues for the current year is made, at the option of the member, in advance of the annual meeting, promises to be a very successful and popular method of collecting the annual assessment, and of fostering the financial resources of the Association. It also facilitates registration, and enables the Committee of Publication to decide, at a much earlier period than has hitherto been practicable, what number of copies of the next annual volume will be required. Experience has shown that when the sending of the Treasurer's annual circular calling for payment of dues is deferred until *after* the meeting, at least three months elapse before sufficient dues are collected to enable the Committee to decide upon the edition to be printed, the publication of the volume being correspondingly delayed. Last year, indeed, the payments were so dilatory that it became necessary to send out a second notice as a reminder to members before any such decision could be arrived at, and even when an edition, based on a liberal estimate, was decided upon, it failed to be sufficient to supply a number of the less punctual members with copies. The experience of the past year should be a warning to members of the risk they incur of losing the volume by postponement, and of the necessity of forwarding their annual dues to the Treasurer in advance of its publication.

The number of members upon the rolls of the Association immediately antecedent to the opening of the present session was about 2100. Undoubtedly a large number of these were Centennial visitors of 1876, who attended the meeting of that year at

Philadelphia with laudable but not wholly professional motives. The list of membership became, therefore, greatly augmented, or rather inflated, under the temporary pressure and excitement of that memorable period. They were, many of them, members of but a single year, whose interest in the Association was not permanent, and who were connected with it by no binding affinities. It is not, therefore, a matter of surprise that during the year just past so many hundreds of members failed to pay their annual dues. Other causes have undoubtedly operated to produce a similar result, and among them may be particularly mentioned the provision of the By-Laws which specifies that "any permanent member who shall fail to pay his annual dues for three successive years shall be dropped from the roll of permanent members." Section 6 of the Plan of Organization of the Association, as well as the By-Laws, expressly state that the contribution of each member is an annual assessment or due; that is, a due *annually paid*. In apparent conflict with this is the By-Law just referred to, by which a member is allowed to pay his dues but once in three years, and still retain his membership. This was certainly intended as an accommodation to those who might be prevented by unavoidable circumstances from complying with the annual requirements as to dues, and by such is deservedly appreciated. The experience of the Treasurer, however, during another year of practical observation of the financial working of the Association, and the frequently expressed sentiments of members on this very point, convince him that this liberal action is too often interpreted—he thinks unfairly—as a means to evade the regular payment of annual dues. It has become, indeed, the habit of too many of the members knowingly to regard it as a triennial instead of an annual assessment, under which they are still able to retain their place on the list of members of the Association. The Treasurer hesitates to make any proposition at this time in the shape of formal action looking to a modification of this liberal provision for triennial payment, but offers to the Association the suggestion whether it might not be judicious and advisable to require the payment of dues at least once in *two* years, instead of three, by those who desire to preserve their membership in this body. It seems to him exceedingly probable that their ties to the Association would then be more closely drawn, that their interest in it would not be of a merely occasional character, and that pecuniary advantage might follow to the Association with-

out harshness to its individual members. In the course of another year the triennial period will expire in which the numerous members who joined the Association in 1876, and who have not since taken an interest in its work, will, according to the Rules, cease to be any longer connected with it. The Treasurer will then be able to report more precisely upon the financial aspects of membership, so far as the points just mentioned may be involved, and any desirable change in the By-Laws may be properly deferred until that time.

All of which is respectfully submitted.

RICHARD J. DUNGLISON,
Treasurer.

Richard J. Dunglison, Treasurer, in account with the American Medical Association.

DR.

To Cash.	Balance as per last Report	\$2446 02
" "	From Delegates and members Buffalo meeting	2355 00
" "	" Permanent members and sales	2905 00
" "	Discount on bill of T. K. Collins, printing	223 16
		<u>\$7929 18</u>

CR.

By Cash.	To Dr. T. F. Rochester, Chairman of Committee of Arrangements, Buffalo meeting (rent of hall, printing, stationery, etc.)	\$230 37
" "	Dr. William Lee, Librarian, postage, etc.	7 25
" "	Dr. William Lee, Librarian, binding, as per order of the Association	200 00
" "	Dr. John A. Wyeth, Prize Essays, as per order of the Association	200 00
" "	Dr. Thos. F. Rochester, Chairman of Committee of Arrangements, expressage	1 75
" "	Dr. H. Praeger, lithographic illustrations of Dr. H. H. Smith's paper on Tubercles of the Bones.	303 66
" "	John Carbutt, 2600 heliographs for Dr. Wallace's paper	78 00
" "	Dr. William B. Atkinson, Secretary, by order of Association	700 00
" "	Dr. William Lee, Librarian, postage	5 00
" "	Dr. William B. Atkinson, Secretary, expenses (freightage, expressage, telegrams, and travel).	93 00
" "	Henry M. Barnes, services as clerk	50 00
" "	T. K. Collins, printing, paper, engravings, and binding 1300 copies of Vol. XXIX. of Transactions; and cards, notices, circulars, and envelopes	4685 47
" "	Dr. William Lee, Librarian, portorage, expressage, stationery, postage, etc.	30 84
" "	H. C. Lea, for cash advanced in delivery of Transactions	49 75
" "	Postage, stationery, freight, and sundries	48 43
" "	Balance	1245 66
		<u>\$7929 18</u>

May 1, 1879—To cash balance \$1245 66

Audited and found correct.

WM. B. ATKINSON,
SAMUEL D. GROSS,
ALBERT FRICKE,
THOMAS M. DRYSDALE,
Committee of Publication.

REPORT OF THE LIBRARIAN.

LIBRARY OF THE AMERICAN MEDICAL ASSOCIATION,
April 1st, 1879.

MR. PRESIDENT:—

I have the honor to report as Librarian, that during the past year, as shown by the accompanying catalogue, there have been added to the library 153 distinct titles, exclusive of yearly volumes of transactions of societies, reports of hospitals, boards of health, and volumes of medical journals, where these have been previously catalogued as distinct titles. This addition makes the library to consist at present of 1073 distinct titles, which comprehend, from a general estimate, about 2816 volumes, inclusive of pamphlets.

This statement, with a perusal of the accompanying catalogue, will show that the library is making steady advances each year, in the number and importance of its volumes, comprising much of the prominent periodical literature of the day at home and abroad. The recent action of Congress in granting a National Medical Museum to the care of the Smithsonian Institution, has enabled Prof. S. F. Baird to furnish the library with increased facilities for shelf room, which have been admirably carried into effect by Mr. Wm. J. Rhees, Chief Clerk of the Institution. To both of these gentlemen thanks are due for their courtesy and sympathy with the interests of the library.

The Librarian assumes that the request made in the body of this report to continue the foreign and home exchanges as heretofore, will, if the report be adopted as written, not require a special resolution, which is therefore omitted. He would state, however, that he has taken the liberty, unauthorized, to subscribe directly to a periodical for the use of the library, viz., the "Index Medicus," as edited by Drs. J. S. Billings and Robert Fletcher, and published by F. Leypoldt, of New York, as being indispensable to the wants and uses of the library: he assumes that this action will be sustained, and would suggest further,

without resolution, that he be allowed the use of a certain sum, say \$100, for the purchase from time to time of such numbers of periodicals, transactions of societies, etc., as are needed to complete sets, have become rare, and are not obtainable in any other way.

As especially a *repository* for American medical literature, the most desirable additions to the library are frequently periodicals and transactions of but little pecuniary value and of but an ephemeral existence. At present the Association, as notably this year, gives in exchange for such a volume of unduly greater cost and present interest, and the Committee of Publication are embarrassed at times to meet their obligations in its issue and distribution; but, on the other hand, the consequent widespread diffusion of the yearly volume, and the fact that these very publications are the ones which become rare and valuable with time, makes the Librarian desire a continuation of the system, notwithstanding a great advantage seems to be at present on the part of a large number of the journals and societies.

The amount of \$200 appropriated last year for binding having been expended, at a cost of 45 cents per volume for neat and substantial work, thus securing, in a permanent form, much that would otherwise be liable to serious injury and loss, the Librarian would ask for a further appropriation this year of \$100, to be expended for the same purpose in preserving the additions of periodicals, etc.

The thanks of the Association are due to all who have assisted in the growth and maintenance of the library.

Respectfully submitted,

WM. LEE.

2111 PENNSYLVANIA AVENUE, WASHINGTON, D. C.

CATALOGUE OF THE LIBRARY.

Catalogue of Additions by Donations, etc., to the Library of the American Medical Association, from May 1, 1878, to April 1, 1879.

Adams (D. S.)—

An Essay on Carcinoma, read before the New Hampshire Medical Society, at its annual Convention, held in Concord, June 19, 1878. Concord, 1878. 8vo., 16 pp. Donor, Author.

Agnew (C. R.)—

A Case of Myxofibroma of the Auricle. 8vo., 2 pp. plate, n. d., n. p. Canthro-plasty as a remedy in certain diseases of the eye. New York, 1875. 8vo., 10 pp. illus.

Clinical Contribution to Ophthalmology. Reported by D. Webster. Reprinted from Archives of Ophthalmology and Otology. Vol. IV. Nos. 3 and 4, New York, 1875. 8vo., 11 pp., illus.

A Preliminary Analysis of two hundred and sixty cases of Asthenopia. (Reprint from the Report of the Fifth International Ophthalmological Congress, September, 1876.) New York, 1877. 8vo. 12 pp.

Otitis. Vol. 1, No. VI. of a series of American Clinical Lectures, edited by E. C. Seguin. New York, 1877. 8vo. pp. 135 to 156, illus.

Contributions to Ophthalmology by, and D. Webster. Reprinted from the Transactions of the American Ophthalmological Society, 1878. 8vo. 25 pp. illus.

Ophthalmic Notes. 1. Trephining the Cornea to remove foreign body deeply imbedded in its substance. 2. A case of double, extremely minute, and apparently congenital lachrymal fistula. 3. A contribution to the statistics of cataract extraction of one hundred and eighteen recent cases. New York, 1878. 8vo. 30 pp. Donor, Author.

Alvarenga (P. F. Da Costa)—

Leçons cliniques sur les maladies du Cœur, principalement au point de vue de la valeur séméiologique du retard du pouls, du double souffle, et de la double vibration des artères. Des effets sur ces phénomènes de la compression simple et combinée faite tantôt avec le stéthoscope sur le point ausculté, tantôt avec les doigts en amont et en aval de ce point et des ectocardies. Traduit du Portugais par le docteur E. Bertherand. Lisbonne, 1878. 8vo. 361 pp. illus. Donor, Dr. E. Bertherand.

Anderson (McCall)—

On the Treatment of the Diseases of the Skin: with an analysis of eleven thousand consecutive cases. Philadelphia, 1873. 8vo. 80 pp. Donor, Dr. R. J. Dunglison.

Bauer (Louis)—

On the Dressing of Stumps. Old Method—Lister's Antiseptic plan—the Bordeaux treatment of Stumps—Burrow's Plan, modified by the author—Comparative Statistics. Reprinted from the St. Louis Clinical Record, Nov. and Dec. 1877. 8vo. 14 pp. Donor, Dr. Wm. B. Hazard.

Biographies. Toner (Joseph M.)—

Biographical Sketch of, by Thomas Antisell, Washington, D. C. Reprint from the memorial volume of the Rocky Mountain Association. Lancaster, Pa., 1878. 12mo. 30 pp. Donor, Dr. J. M. Toner.

Turney (Samuel D.)—

Memoir of, of Circleville, Ohio. Professor of Diseases of Women and Children, in Starling Medical College, by J. H. Pooley. Cincinnati, 1878. 8vo. 36 pp. engraving. Donor, Author.

Yandell (Lunsford P.)—

Eulogy upon, by Theodore S. Bell. Reprint from American Practitioner, April, 1878. 8vo. 22 pp. Donor, Editor.

Boothby, (Josiah)—

Statistical Sketch of South Australia. Published by authority of the Government of South Australia. London, 1876. 8vo. 86 pp. maps. Donor, Author.

Brandeis (Richard C.)—

Notes in Laryngoscopy. Read before the Louisville Medico-Chirurgical Society, December, 1875. From February No. Richmond and Louisville Medical Journal, 1876. Louisville, Ky., 1876. 8vo. 8 pp. illus. Donor, Dr. D. N. Porter.

Charcot—

Lectures on Diseases of the Nervous System. Published with Medical News and Library, July, 1878, to March, 1879. 8vo. 144 pp. illus. Donor, Dr. D. N. Porter.

*Colleges—Annual Announcements, Circulars, etc.**California—*

Medical College of the Pacific (late Medical Department of the University of the Pacific), being the Medical Department of University (City) College, San Francisco. Annual Announcement for 1878. Donor, College.

District of Columbia—

Georgetown University Medical Department. Annual circulars, 30th; annual addresses, 30th. Donor, College.

Howard University Medical Department. 11th annual prospectus. Donor, College.

National College of Pharmacy, 5th. 7th annual circular. Donor, College.

National Medical College of the Columbian University. 57th annual announcement. Donor, College.

Georgia—

College (The) of Phlogistic Medicine, Macon. 34th annual circular. Donor, College.

Illinois—

Woman's (The) Hospital Medical College of Chicago. 2d, 4th, 7th annual announcements. Donor, College.

Kentucky—

Louisville College of Pharmacy. 8th annual announcement. Donor, College.

Maryland. Baltimore—

College of Physicians and Surgeons' circulars for 1878. Donor, College.

Johns Hopkins University. Third annual report, 1878.

Medical Education. Extracts from Lectures delivered before the, by John S. Billings. Baltimore, 1878. 8vo. 42 pp.

Circular of Preliminary Medical Course, 1878-9. 8vo. 12 pp.

Circular of Instruction in Chemistry, 1878-9. 8vo. 4 pp.

Circular of Collegiate Courses, 1878-9. 8vo. 6 pp.

Circular of Instruction in History, Political Economy, Logic, and Ethics, 1878-9. 8vo. 4 pp.

Circular of Lectures in Hopkins Hall. 8vo. 4 pp.

Circular of Historical Lectures, 1878-9. 8vo. 8 pp.

Circular of Lectures on Ethics, 1878-9. 8vo. 4 pp. Donor, University.

University of Maryland, Baltimore. 71st annual circular. Donor, College.
Massachusetts—

Boston (The) Dental College. Annual catalogue for 1878-9. Donor, College.

Harvard University Medical School. Catalogue for 1878-9. Donor, College.
Missouri—

Kansas City College of Physicians and Surgeons. 10th annual announcement. Donor, College.

New York. New York City—

American Veterinary College. 4th annual catalogue. Donor, College.

Bellevue Hospital Medical College. Annual circular for 1878-9. Donor, College.

College of Physicians and Surgeons. 71st annual announcement. Donor, College.

University of the City of New York Medical Department. Annual announcement for 1878-9. Donor, College.

Ohio. Cincinnati—

Cincinnati College of Medicine and Surgery. 44th annual announcement. Donor, College.

Cincinnati College of Pharmacy. 8th annual announcement. Donor, College.

Medical College of Ohio. 58th annual announcement. Donor, College.

Miami Medical College. 19th annual announcement. Donor, College.

Cleveland Medical College. Annual catalogue, 1878-9. Donor, College.

Columbus—Starling Medical College. 32d annual commencement. Donor, College.

Oregon—

Willamette University Department of Medicine. Announcement for 1878-9. Donor, College.

Pennsylvania—

Swarthmore College. 9th annual catalogue. Donor, College.

University of Pennsylvania, Medical Department. 113th annual announcement. Third edition. Catalogue for 1878-9. Donor, College.

Woman's (The) Medical College Catalogue for 1878-9. Donor, College.

Vermont—

University of Vermont, Medical Department. 26th announcement. Donor, College.

Coomes (M. F.)—

Remarks on Naso-pharyngeal Catarrh. From the American Medical Bi-

weekly, June 8th, 1878. Louisville, Ky., 1878. 8vo. 8 pp. Donor, Dr. D. N. Porter.

Coover (E. H.)—

Suggestions in the Treatment of Spinal Diseases and Curvature. Reprinted from the Medical and Surgical Reporter of April 12, 1878. 8vo. 4 pp. illus. Donor, Author.

Crawford (John B.)—

An Essay on Malpractice ; read by appointment before the Luzerne County Medical Society, at Wilkesbarre, January 8, 1879. Published by request of the Society. 8vo. 20 pp. Donor, Author.

Crinon (C.)—

Hæmoglobin Albuminoid Ferruginous Principle of Blood. Its use as a tonic, its superiority over chalybeates, phosphates, and raw meat. Paris, 1878. 8vo. 8 pp.

Directories—

Illinois (The) State Medical Register for 1877-8. Published annually under the supervision of the Chicago Medico-Historical Society, with the co-operation of the Illinois State Medical Society, D. W. Graham, Editor. Chicago, 1877. 12mo. 214 pp. Donor, Editor.

Dunghison (Richard J.)—

The Practitioner's Reference Book, adapted to the use of the Physician, the Pharmacist, and the Student. Philadelphia, 1878. 8vo. 341 pp. woodcuts. Donor, Author.

Dunster (Edward S.)—

The History of Spontaneous Generation. A paper read before the Ann Arbor Scientific Association, March 4, 1876. Reprinted from the Transactions of the Association, Vol. I. 1876. Ann Arbor, 1876. 8vo. 30 pp.

The Prophylaxis of Puerperal Convulsions. Reprinted from Toledo Medical and Surgical Journal. Toledo, 1878. 8vo. 16 pp.

The Logic of Medicine. An address delivered on the occasion of the twenty-fifth anniversary of the New York Academy of Medicine. December 30, 1872. (Reprinted from the N. Y. Medical Journal, March, 1873.) New York, 1873. 8vo. 31 pp.

The History of Anæsthesia. A paper read at the annual meeting of the Washtenaw County Medical Society, held at Ypsilanti, Michigan, June 25, 1875. (Reprinted from the Peninsular Journal of Medicine, August, 1875.) Ann Arbor, 1875. 8vo. 20 pp.

The Relations of the Medical Profession to Modern Education. An address delivered at the Commencement of the Medical Department of the University of Vermont, June 16, 1869. (Reprinted from the N. Y. Medical Journal, December, 1870.) N. Y. 1870. 8vo. 25 pp.

The use of the Obstetric Forceps in Abbreviating the Second Stage of Labor; a paper read before the Michigan State Medical Society, May 10, 1877. (Reprinted from the Transactions of the Society for 1877.) Lansing, 1877. 8vo. 32 pp.

Remarks on Double Monsters. Delivered at a meeting of the Washtenaw County Medical Society, held in Ann Arbor, March 17, 1874. 8vo. 13 pp. Donor, Author.

Education—

Report of the Commissioner of Education for the year 1876.

Circular of Information, No. 1, 1878.—The Training of Teachers in Germany. 8vo. 36 pp. Donor, U. S. Commissioner of Education.

Engleman (Geo. J.)—

The Obstetric Forceps, when and how to use it. Cairo, Illinois, 1878. 8vo 9 pp.

The Hystero-Neuroses, with especial reference to the Menstrual Hystero-Neurosis of the Stomach. Reprint from Vol. XI., Gynecological Transactions, 1878. 8vo. 38 pp.

A Hystero-Psychosis Epilepsy dependent upon Erosions of the Cervix Uteri. St. Louis. Reprint from St. Louis Clinical Record, 1878. 8vo. 5 pp.

Batley's Operation; three fatal cases, with some remarks upon the indications for the operation. Reprinted from the American Journal of Obstetrics and Diseases of Women and Children, Vol. XI. No. 111, July, 1878. New York. 8vo. 35 pp. Donor, Author.

Engineer Department, U. S. Army—

Maps, exhibiting some of the Operations of the late War. Folio sheets. 1878. 1. Atlanta Campaign, in 5 sheets. 2. Operations in front of Atlanta. 3. Chattanooga. 4. Franklin. 5. Knoxville. 6. Marches of the United States forces under General Sherman.

Maps illustrating the Operations of the Armies of the Potomac and James. 17 maps, folio. Donor, Engineer Department.

Explorations and Surveys—United States—

United States Exploration of the Fortieth Parallel. Clarence King, Geologist in charge.

Systematic Geology, by Clarence King. Submitted to the Chief of Engineers, and published by order of the Secretary of War, under authority of Congress, illustrated by xxviii. plates and xii. analytical geological maps, and accompanied by a geological and topographical atlas. Washington, Government Printing Office, 1878. 4to. 803 pp. Atlas to same, Geological and Topographical. 1876. Folio, v. maps, 24 sheets. Donor, Engineer Department U. S. A.

Explorations and Surveys—Department of the Interior—

United States Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell, Geologist in charge.

Contributions to North American Ethnology. Vol. I. 1877. 4to. 361 pp. illustrations, 2 maps. Vol. III. 1877. 4to. 635 pp. illus. 1 map. Washington, Government Printing Office.

United States Geological Survey of the Territories—

Miscellaneous Publications. No. 7. Ethnology and Philology of the Hidatsa Indians, by Washington Matthews. 1877. 8vo. 239 pp.

No. 9. Descriptive Catalogue of Photographs of North American Indians, by W. H. Jackson. 1877. 8vo. 124 pp.

No. 10. Bibliography of North American Palæontology, being a report upon the publications that have hitherto been made upon the Invertebrate Palæontology of North America, including the West Indies and Greenland, by C. A. White and H. Alleyne Nicholson. 1878. 8vo. 132 pp.

No. 11. Birds of the Colorado Valley. A repository of scientific and popular information concerning North American Ornithology, by Elliott

Coues. Part First. Passeres Lanüdae, Bibliographical Appendix, seventy illustrations. 1878. 8vo. 807 pp.

Vol. XI. Monographs of North American Rodentia, by Elliott Coues and Joel Asaph Allen. 1877. 4to. 1091 pp. illus. Washington, Government Printing Office. Donor, Dept. of Interior.

Explorations and Surveys—Engineer Department, U. S. A.—

Geographical and Geological Explorations and Surveys West of the one hundredth meridian, in charge of First Lieut. Geo. M. Wheeler. Vol. III. Parts I. to VI. Geology. Washington, Government Printing Office, 1875. 4to. 666 pp. illustrated. Donor, Lieut. Geo. M. Wheeler.

Fenner (C. S.)—

A Treatise on the Diseases of Refraction and Accommodation. Louisville, Ky., 1873. 8vo. 29 pp.

Resumé of the Modern Views of the Pathology and Treatment of Glaucoma. Read before the Kentucky State Medical Society, 1874. Louisville, 1874. 8vo. 13 pp. Donor, Dr. D. N. Porter.

Fox (Wilson)—

The Diseases of the Stomach, being the third edition of the "Diagnosis and Treatment of the varieties of Dyspepsia." Revised and enlarged, with illustrations. Philadelphia, 1875. 8vo. 283 pp. Donor, Dr. R. J. Dunglison.

Goldsmith (W. T.)—

The Pith of the dried Corn-stalk as a Uterine Tent; and general remarks upon the use of Uterine Tents in Gynæcological Practice, with cases. Reprint from the Transactions of the Medical Association of Georgia. Atlanta, n. d. 8vo. 25 pp. Donor, Author.

Gosselin (L.)—

Clinical Lectures on Surgery, delivered at the Hospital of La Charité. Translated from the French, by Lewis A. Stimson, with twenty-one illustrations. Philadelphia, 1878. 8vo. 350 pp. Donor, Dr. R. J. Dunglison.

Grissom (Eugene)—

True and False Experts. (From the American Journal of Insanity, for July, 1878.) To which is appended, A Rejoinder to Dr. Hammond's "Open Letter." 8vo. 49 pp. Donor, Author.

Hamilton (J. A.)—

Epidemic Dysentery. Read before the Transylvania Medical Association, May 16, 1876. Folio, 1 p. Donor, Dr. D. N. Porter.

Hammond (William A.)—

An Open Letter to Eugene Grissom, M.D., LL.D., etc. Second edition, with a preface and a postscript. New York, 1878. 8vo. 16 pp.

A second Open Letter to Dr. Eugene Grissom. New York, 1878. 8vo. 18 pp. Donor, Author.

A Contribution to the Study of the Nature and Consequences of Malarial Poisoning. From the September (1877) number of the St. Louis Clinical Record. 8vo. 8 pp. Donor, Dr. Wm. B. Hazard.

Hartman (J. H.)—

Eight cases of Intra-Laryngeal Growths removed through the Natural Passages. Reprint from Virginia Medical Monthly. June, 1878. 11 pp. illus. Donor, Author.

Holmgren (F.)—

Color-Blindness in its Relation to Accidents by Rail and Sea. From the Report of the Smithsonian Institution for 1877. Washington, 1878. 8vo. p. 131 to p. 200. Donor, Smithsonian Institution.

Homœopathy—its Status in Public Institutions of Learning. Reprinted from the March number of the Physician and Surgeon. Ann Arbor, Michigan, n. d. 4 pp.

Hospitals, Asylums, Dispensaries, and Infirmaries. Reports and Documents Relating to—

Great Britain. London—

Guy's Hospital Reports. Edited by H. G. Howse and Frederick Taylor. 8vo. Third series, Vol. XXIII. Exchange.

St. Bartholomew's Hospital Reports, Vol. XIV. Exchange.

St. George's Hospital Reports, Vol. VIII. Exchange.

St. Thomas's Hospital Reports, Vol. VIII. Exchange.

United States. District of Columbia—

Columbia Hospital for Women, and Lying-in Asylum—

Charter and By-laws, 1877-1878.

Annual Report for the fiscal year ending June 30, 1878. Donor, Dr. P. J. Murphy.

Kentucky (The) Infirmary for Women and Children. Announcement for 1877. Louisville, Ky. Donor, Dr. D. N. Porter.

Massachusetts—

Boston City Hospital Medical and Surgical Reports, Second Series. Boston, 1877. 8vo. 316 pp. Exchange.

State Lunatic Hospital at Northampton. Annual Report for 1878 of the Trustees to the Governor of the State. Boston, 1878. 8vo. Donor, Trustees.

New York State Lunatic Asylum, Utica. Annual Report for 1877 of the Managers to the President of the Senate, Albany. Donor, Dr. J. P. Gray.

Pennsylvania. Philadelphia—

Pennsylvania Hospital for the Insane. Annual Report for 1879 of the Physician-in-chief to the Board of Managers. Donor, Physician-in-chief.

Woman's (The) Hospital of Philadelphia. 17th Annual Report. Donor, Hospital.

West Virginia—

Institutions for the Deaf and Dumb and the Blind at Romney. Report for 1877-8. Donor, Dr. John C. Hupp.

Hospital for the Insane. Biennial Report for 1877 and 1878. By-laws adopted July 1st, 1871. Also, the Fifty-eighth Chapter of the Code relative to Insane Persons. Weston, 1871. Donor, Dr. John C. Hupp.

Hupp (John C.)—

Diagnostic Importance of Symptoms. Reprint from Transactions of the Medical Society of the State of West Virginia. 1878. 8vo. 8 pp. Donor, Author.

*Hygiene (Public)—**District of Columbia—*

Annual Report of the Board of Health for 1878.

Statement of Births, Marriages, and Deaths from April 22 to July 29, 1876; May, June, Sept. to Dec. 1877; 1878, Jan.; Feb. 1879. Donor, Dr. Theodore Meade.

Louisiana—

Excerpta from the Annual Report to the Board of Health for 1878. By Joseph Holt, Sanitary Inspector of the Fourth District of New Orleans. New Orleans, 1879. 8vo. 14 pp. Donor, Board of Health.

Massachusetts—

City of Boston Board of Health. Third, Fourth, Fifth, and Sixth Annual Reports.

The Sanitary Condition of Boston. The report of a medical commission appointed by the Board of Health of the City of Boston. Boston, 1875. 8vo. 199 pp. Donor, Board of Health.

Michigan State Board of Health.

*Diphtheria—*Restriction and Prevention of. Document issued by the. 8vo. 8 pp.

*Scarlet Fever—*Restriction and Prevention of. Document issued by the. 8vo. 8 pp.

*Smallpox—*The Prevention and Restriction of. 1877. 8vo. 1 p.

Circular 25 to supervisors and other officers of townships relative to notices of diseases which endanger the public health; duties of householders, physicians, and others. 1878. 8vo. 8 pp.

Circular 28, relative to the work of health officers and of local boards of health. 1878. 8vo. 8 pp.

Drowned, treatment of the. 1 sheet 4to. illustrated.

Annual Reports; Third, Fourth, Fifth, Sixth.

Laws of the State relating to the Public Health. Compiled and published under the supervision of the Secretary of State, in pursuance of Joint Resolution No. 18 of the Session Laws of 1875. Lansing, 1876. 8vo. 86 pp. Donor, Dr. Henry B. Baker.

Jones (Joseph)—

Medico-legal evidence relating to the detection of human blood presenting the alterations characteristic of malarial fever, on the clothing of a man accused of the murder of Narcisse Arnieux, Dec. 27, 1876, near Donaldsonville, State of Louisiana, Parish of Ascension, Fourth Judicial District Court, State of Louisiana (No. 38) *vs.* Wilson Childers *et als.* New Orleans, 1871. Reprinted from the New Orleans Medical and Surgical Journal for August, 1878. 8vo. 18 pp.

Kedzie (R. C.)—

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ADDRESS

OF

THEOPHILUS PARVIN, M.D.,

PRESIDENT OF THE ASSOCIATION.

VOL. XXX.—7

ADDRESS OF THEOPHILUS PARVIN, M.D.,

PRESIDENT OF THE ASSOCIATION.

GENTLEMEN:—

SCIENCE, Literature, Philosophy, and Theology are the great subjects of human study. Science is the knowledge of nature and of nature's laws. Literature, including history, is the representation of man's life; it tells his joys and sorrows, his aspirations and achievements, his victories and defeats, his glory and shame; it is "man's autobiography." Philosophy studies man's psychical nature, both in its mental and moral manifestations; it seeks to discover the relation he bears to the past and to the future, to nature and to the universe, and in its highest development brings the reflecting mind to believe in an ultimate unity, a great first cause, the fountain of all other causes, a power originant of them if not immanent in them. Theology discusses the being, attributes, and providence of the Divine, the uncreated, the eternal, whose existence philosophy in its sublimest aspirations maintains, even if that existence be not one of the fundamental convictions of the human mind.

Nevertheless, these divisions are in some degree arbitrary. For example, if there be a Divine Being, all-wise and all-powerful, and nature his creation, his name will be recorded on its pages; and to the study of such record, the title of natural theology has been given.

Moreover, man is a part of nature, made of the same material as countless other organisms, and subject to the same general laws, so that the science of physical man is a part of the science of nature. A complete knowledge of man, therefore, includes both science and philosophy.

That department of physical science which has for its objects the restoration from disease or injury, the preservation of human health and the prolongation of human life, is the queen of sciences, and in her royal right and in her grand work accepts

the services of her handmaids, anatomy, physiology, chemistry, and botany, and commands the obedient subtle forces of nature.

And yet, if Medicine limits its knowledge to that of a mere machine, if its ultimate reason rests in the scalpel, retort, test-tube, and microscope, the whole of man's nature is not comprehended. Will, understanding, reason, conscience, are as surely a part of the human being as muscle and bone, nerve and vessel, liver and lung, brain and heart. Knowledge of the intellectual, of the emotive, and of the moral nature of man, of their laws and manifestations, is just as essential to the thoroughly furnished physician as any knowledge of the merely material organism.

With the marvellous advance made during recent years in some of the physical sciences, the light of their grand discoveries blazing about us, we are well-nigh blinded by the near and sudden glory, and some distant objects that we once saw distinctly, have altogether faded, or have grown so dim and shadowy that in "the strife of aching vision" we scarcely know what they are, where they are. Aristophanes, in one of his plays, ridiculing some of the philosophy of his day, taught that Vortex reigned in the place of Jupiter, and that the three gods in whom belief should be reposed were Chaos, the Clouds, and the Tongue. Twenty-three centuries had nearly passed and Comte found the Jupiter in man; the apotheosis of humanity was declared. Twenty-three centuries have passed, and in some of the literature of the day, philosophical and scientific, there might be found reason to repeat the very jest of the Greek poet.

The heavens here bright with new light; there dark with the disappearance of the old. We breathe an atmosphere of doubt—at any rate, of anxious inquiry—and sometimes find our footsteps tottering and uncertain.^{1*} Nay, sometimes we seem wrapped in the thick darkness of conflicting opinions, and like Ajax in the long night of strife pray most earnestly for the light of day.

Science,² says one of its most distinguished American representatives, adopting the teaching of Lord Bacon, is the practical interrogation of nature. Let us interrogate medicine, discuss

* The numerals in the text refer to notes at the end of the Address.

some of its philosophical problems, and see if it makes any response to most earnest questionings of the human soul.

At the very outset of our inquiries is, Why does Medicine exist? What reason for it? It is born of human sympathy; it springs from the wants of man, and is an evidence of human power; it lives because it can live—it has a right to live. Montaigne wittily remarked that he rode his horse, not that he knew that he had any such right—possibly the horse had a right to ride him—but because the horse let him. Doctors, however, do not practise physic because the people let them, but because the people want them, demand them. Medicine comes in response to the cry of human suffering—of man's writhing with pain, or starting back, in instinctive horror, from imminent death.

Pain is the first lesson in the book of evil which most human beings, at one time or another of their lives, read in such bitterness of sorrow. "The idea of evil is a generalization from the perception of pain."³

And here we are brought face to face with this problem of physical suffering, this mystery of pain. "Pain expresses an ultimate fact of human consciousness, a primary experience of the human mind, resolvable into nothing more general or more fundamental than itself."⁴ But why is this fact?

In reading John Stuart Mill,⁵ one is almost tempted to believe that a worse than Nero is enthroned in nature, and is inflicting cruelties upon the human race, with less reason than the mistress in Juvenal chastised her slave.⁶

Herbert Spencer⁷ rejects a Supreme Beneficence, because of the existence of suffering on the part of man and inferior creatures.

Among the reasons for the existence of pain, the most obvious is that which the word itself signifies. Often, indeed, pain is punitive. Tracing the word to its Greek⁸ derivation, we find that it originally meant blood-money, or compensation for the killing of a kinsman, while the Latin *poena* simply expresses punishment.⁹

Undoubtedly, infractions of the laws of health or of virtue generally bring punishment, but not always or alone to the offender. Sometimes the wave of suffering widens, bearing innocent and guilty to a common ruin, or sweeps away only the innocent.

Countless children bear in their bones and written upon their faces, the sins, often of their fathers, sometimes of their mothers. Many a pure wife walks a *via dolorosa*, made for her by a licentious husband.

Pain is protective. This conservative power makes it one of the most efficient guardians of health.

The diagnostic value of pain is very great. Pain not only warns the patient of the approach or the presence of disease, but also guides the physician to its recognition and in its treatment.

There are moral uses of pain. Pain is a discipline: Jeremy Taylor has declared with his characteristic eloquence, "Softness is for slaves and beasts, for minstrels and useless persons, for such who cannot ascend higher than the state of a fair ox, or a servant entertained for vainer offices; but the man who designs his son for nobler employments, to honors and to triumphs, to consular dignities and presidencies of councils, loves to see him pale with study, panting with labor, hardened with sufferance, or eminent by dangers."

An attack of sickness may lead to an entire reformation of life. Then, too, what revelations of true nobleness, of all that is gentle and beautiful, unselfish and loving, have we witnessed on the part of some who were called to endure most painful, yea loathsome, yea hopeless disease; and we were ready to exclaim—

"How sublime a thing it is to suffer and be strong."

The Prometheus Vincetus is one of the grandest ideals of ancient mythology.

One of the most distinguished of British scientific men, Prof. Owen, has admirably¹⁰ depicted the beneficial subjective influence of suffering.

So, too, in the sympathy that human suffering evokes, the skill, the kindness, the self-sacrifice, and the unwearied, ever-watchful attention manifested for its relief, we see beneficial results. Take away, for example, those religious orders of women whose whole lives are consecrated to the care of the sick, women in regard to many a one of whom we might apply the words of Tennyson—

"Her eyes are homes of silent prayer,
Her loves in higher love endure"—

and one of the brightest pages of human history is blotted out. Thus, too, of all other noble, self-sacrificing remedial agencies for the sick.

What divine beauty of life, making sunshine in a shady place, is manifested by wife or mother, sister or daughter, when the home is entered by disease. There is no gloom of suffering too dark for woman's smile not to lessen, no depth of distress too profound for woman's sympathy and helpful hand not to reach.

Mr. Mill thinks it quite a natural question, Whether so complicated a machine as the human body could not have been made to last longer, and not get so easily out of order? Reference will be made to the first part of the question hereafter, and the answer that most physicians would make to the second part would be, that considering the needless wear and tear, and the general ill-usage, either from ignorance or neglect, these bodies get, it is wonderful they are not oftener out of order. Moreover, the experience of the vast majority of human beings testifies that so far as physical suffering is concerned, the good greatly overbalances the evil; days of health have been much more frequent than days of sickness.

Even with the various utilities of pain, both direct and indirect, that have been mentioned, we still must refer to it as often a mystery; much is revealed, but much else is hidden. The different attempted solutions of this remaining mystery we omit, only quoting in concluding the topic the eloquent words, in reference to it, of a distinguished London surgeon, the late Mr. Hinton.¹¹ "A touch might transform it wholly. One flash of light from the Unseen, one word spoken by God, might suffice to make the dark places bright, and wrap the sorrow-stricken heart of man in the wonder of an unutterable glory."

And yet one thought more. Mr. Jevons,¹² at the close of a paragraph referring to the presence of pain, and the difficult reconciliation of the fact with the hypothesis of a creator all-powerful and all-benevolent, remarks: "We perpetually find ourselves in the position of finite minds attempting infinite problems, and can we be sure that where we see contradiction an infinite intelligence might not discover perfect logical harmony?"

A similar view is found in these words of one of the most gifted poets of the century, Mrs. Browning:—

"Experience, like a pale musician, holds
 A dulcimer of patience in his hand;
 Whence harmonies we cannot understand
 Of God's will in the worlds, the strain unfolds
 In sad, perplexed minors.
 We murmur, 'Where is any certain tune
 Of measured music in such notes as these?'
 But angels leaning from their golden seats
 Are not so minded. Their fine ear hath one
 The issue of completed cadences."

Greater than the mystery of life, it has been well said, is the mystery of death to child and savage. Nay, it is one of the greatest of mysteries unto all. But death is the law of all earthly existence. Lord Bacon has said that possibly it is as easy to die as to be born; certainly it is as natural; death is the necessary sequence of life—sequence, not consequence, for not death, but the continuance, the perpetuation of life is the purpose, the end of life. "The individual life is the continuation of anterior, and the fountain of ulterior lives."

Stahl, in the extraordinary powers with which he invested the Anima, making it the ruler and the governor of the body, has asked, "Since men can live for a time, why not always?"

While medicine has done much, and will do more to prolong the average of human life, the perpetuation of the individual existence is as vain a hope as increasing the physical development to that of the fabled Titans.

Storms on sea and on land, war, famine, pestilence, earthquakes, fire and flood, and the various so-called accidents on ship and on shore, have hurried millions to untimely graves. Even if none of these cut short human life, diseases in numerous forms—coming to us from our ancestry, coming from without or developed from within, coming at every stage of life—bear to the great majority the accursed shears of Atropos, so that few live to reach the goal of old age "weary, wayworn, and broken with the storms of life." Fontenelle, dying at ninety-nine years, when asked what he experienced, replied, simply the difficulty of existing.

To those who have thus had their days prolonged, death is inevitable from changes in the organism, degeneration of tissue rendering the performance of life's functions impossible.

It were a grievous thing if old men did not die, says Dr. Maudsley, for in that sad case the world's movement onward to

where it is going would be very sluggish if it were not actually arrested. So, too, human longevity would violate that proportion established between the different stages of life in all the mammalia, or by the prolongation of the earlier stages in man would bring increased cares, casualties and liabilities to disease and death. It is not difficult, as Dr. Symonds has stated, to discover in the limitation of our existence its fitness to our constitution, and to the universal frame of things.

Life is sufficient for all its purposes if well employed, was the just observation of Dr. Johnson, "and what follower of medicine can forget that the immortal sage of Cos, by the example which he afforded in his well-spent life, disarmed his own antithesis of its woeful point," ο βίος βραχύς η δε τέχνη μακρά.¹³

But what is this man thus made subject to disease and death, man whose *Misereres* are the invocation of the physician, and whose most grateful *Te Deums* ascend when the physician's skill has restored health or rescued life?

If, to the poets,¹⁴ "one impulse from a vernal wood" has an important lesson "of moral evil and of good"—and the¹⁵ "flower in the crannied wall" has the secret of man and of God—how much clearer revelation of high truths the proper study of man might make to physicians.

Consider the very commencement of human life in the fecundated ovum. Behold a cell $\frac{1}{120}$ of an inch in diameter, an ovum which neither chemistry nor the microscope can distinguish from the common mammalian ovum. And yet, in that human ovum there dwell physical potentialities, species, race, family, individuality; in that ovum there is the assured promise of all organs that, in their harmony and co-ordination, make a perfect organism. In every living germ, said the great French physiologist, Claude Bernard, there is a directing idea which is developed and manifested by the organization. One by whom some of us were instructed in our student days, the late Dr. Samuel Jackson, of the University of Pennsylvania, in¹⁶ eloquent terms, declared that the ideal plan of the universe, in the minute as in the vast, for each individual as for the whole, must have preëxisted to the creation in the Divine mind. Does not this correspond with the teaching of Plato who made the causes of things an efficient architect, ideas and matter? But before Plato, the voice of one of earth's most famous kings bowing before the throne of the Author of existence, declared, "My

substance was not hid from thee, when I was made in secret, and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, yet being imperfect; and in thy book all my members were written, which, in continuance, were fashioned, when as yet there was none of them."

The facts of heredity are equally inexplicable, without the recognition of "a casual incarnation in the germ," of a directing idea making itself manifest through matter. Physical and chemical forces, molecular play of organic matter cannot explain the transmission of physical, intellectual, and moral qualities from parent to child; they cannot explain the slumbering, it may be through one or more generations, of these distinctive qualities, to reappear in subsequent ones. They are dumb before what has been termed the heredity of influence.¹⁷

It is remarkable, too, in the study of heredity¹⁸ that moral qualities are transmitted with more certainty than intellectual.

Pathological heredity presents facts of the greatest interest. Thus we find disease transmitted from one or the other parent to the offspring, and this disease may show itself in the child before it does in the father or the mother. In illustration, a daughter dies of cancer, and subsequently the mother dies of cancer affecting the same or another organ. Or, again: the malady may date back to a grandparent, a father or mother giving to children that of which he or she presented not the slightest manifestation during a long life.

Then, too, one of the most surprising facts is pointed out by Prof. Chauffard, that of all the maladies which proceed from immediate progenitors, or having affected anterior generations, may be transmitted by a second generation, those which are the most certain of continuance, the most inevitable, are not those involving structural changes, not cancer or tubercle for example, but the *neuroses*, such as hysteria and epilepsy, diseases that present no appreciable organic alteration. What can chemistry say before such facts, and do they not testify that the most material element is lost in these transmissions, the more the directing and final idea prevails?

I will not wait to speak of the evolution of the various parts of the organism—of the swift and perfect formation of a brain where no thought can yet dwell—of the eye constructed where there is no light—of the ear where there is no sound, and of lungs where pulmonary respiration is impossible; all these and

more marvels of ingenious and harmonious construction accomplished in a few months by the power of a single cell and from a single fluid. I speak not of the wonderful accommodation and adaptation on the part of the maternal organism for its high office—adaptation and accommodation so wonderful, indeed, that the¹⁹ greatest of living obstetricians has spoken of them as a miracle.

Nor shall I speak of the transition to the external world, save to remind you that one of our own guild, one who, though dead for more than a century, is never mentioned without profound respect by both physicians and philosophers, Dr. David Hartley,²⁰ presents from this transition an ingenious argument for our immortality, the conclusion of the argument being that our birth was even intended to intimate to us a future life as well as to introduce us to the present.

Nor is it necessary for our present purpose to wander in the shades of speculation as to when, where, and how man originated. It matters not just now as to whether his was a special creation, or whether he is a descendant through uncounted millions of years of ascidian ancestry; whether the beginnings of life on our globe were from a single germ, from few or many germs, and whether those germs were placed here directly by a divine hand, or dropped from some star in its swift flight. Nay, even whether matter in the far-distant morning of the earth had “the promise and potency of every form and quality of life,” an abiogenesis then possible of which no shadow of manifestation is seen to-day. No difference as to man’s origin, lowly or lofty, remote or near, but consider man as he now is, “the heir of all the ages,” and what is his nature?

The general belief of mankind is that this nature is dual, and that belief is expressed by the terms body and mind. “The distinction between them is so obvious that it is recognized in every language; and the knowledge of it, therefore, precedes speculation, and is anterior to all science and philosophy; for language is the expression and record of the primitive observation and unprejudiced common sense of mankind.”²¹ In its general acceptance it has the same evidence as Cicero²² gives for a law of nature.

A distinguished French member²³ of the profession refers to “the duality of man’s nature so universally admitted since the school of Plato, so dogmatically consecrated by the fathers of

the church under the title of *homo duplex*, and so judiciously expressed in our day by the spiritualist school under the double denominations of the physiological and psychological man." He proceeds to state that this belief is anterior to all social institutions, to all legislation; that it is naturally and constantly in the universal consciousness of peoples; and that human duality is not only a moral fact, but a physiological law, and in conformity with logical law.

The assertion of human duality includes two propositions:—First, man has a physical organization; and second, associated with this physical organization is mind; mind and body are man, at least the only man we now know.

Let us first consider man as a material organism. He is born, grows, attains his acme of development and physical vigor, declines, decays, dies. Have physical forces their periods of youth, of maturity, and of old age? Has inorganic matter any corresponding periods? During his life, as in its very beginning,²⁴ a creative power is constantly manifested. By a chemistry more subtle than inorganic nature exhibits, this power lifts lifeless matter to life, creates the living from the dead. If the chemist in his laboratory has produced certain materials contained in inorganic matter, such as taurine and urea, they are in the body products of alteration, of decomposition, ready to be returned to the inorganic world; he has never made, he never can make liver cells, brain cells, blood globules. I do not believe, therefore, the phenomena of living beings can all be referred to physico-chemical laws, but we must, with Dr. Beale,²⁵ "accept the idea of vital power as being super-physical," and with that idea its correlate, a living Creator of such power.

Such a Creator as Beale refers to is very different from the God-atom which Büchner declares, "the atom, or the smallest indivisible and fundamental part of matter, is the God to whom all existence, the lowest and the highest, is indebted for its being." But really more familiar names than that of Büchner are identified with almost as strange an hypothesis.²⁶ Prof. Chauffard, referring to the suggested "evolution of living protoplasm from not-living matter," and the subsequent transformations of this protoplasm into all the forms of life our earth presents, as "impossibilities," exclaims: "And it is in the name of these impossibilities that a science which claims to be altogether experimental and positive, wishes to impose a complete

genesis of organized beings, and excludes from this genesis all directing and final idea."

Of the perfections of the human body and its various organs, of the eye for example, so wonderful in construction and adaptation that the greatest of England's natural philosophers, Sir Isaac Newton, asked, "Did not He who made the eye know the laws of optics?" I shall not now speak. To believe that stones, responsive to the lyre of Amphion, took their places in symmetrical order and formed the walls of hundred-gated Thebes, or that the accidental association of letters constructed the Iliad, would be trifling trials to ordinary faith in comparison with believing that this human body, fearfully and wonderfully made, is not the work of intelligent design.²⁷

I pass now to the consideration of the second proposition, to wit, the complete conception of man includes mind. Many years ago one of the most eminent of Scotch metaphysicians, the late Sir William Hamilton, said: "Should physiology ever succeed in reducing the facts of intelligence to the phenomena of matter, philosophy would be subverted in the subversion of its three great objects—God, free will, and immortality."

Has physiology reduced the facts of intelligence to the phenomena of matter? Certain utterances would seem to indicate that some answer this question affirmatively, and they believe the "soul is but the sum of the brain functions, and psychology but a chapter of physiology." "The brain secretes thought as the liver does bile." (Cabanis.) "—The view entertained by the best cerebral physiologists is, that the mind is a force developed by the action of the brain." (Hammond.) "Thought is a motion of matter." (Moleschott.)

Next we ascend to higher authorities, whose utterances are not quite so positive: "All states of consciousness in us are immediately caused by molecular changes of the brain substance." (Huxley.) "Subjective and objective faces of the same fact." (Herbert Spencer.) And then the "undivided twins" of Professor Bain, "mental and physical proceed together."

"The late Mr. Lewes argued that since feeling, or sensibility, is an invariable accompaniment of the action of nervous centres, it is more philosophical to regard the psychical and physical events as two parts of one reality, and consequently to view feeling as a co-efficient, and not, with Professor Huxley, as a collateral result of nervous process."²⁸

Again, we learn from Professor Huxley: "In itself it is of little moment whether we express the phenomena of matter in terms of spirit, or the phenomena of spirit in terms of matter; matter may be regarded as a form of thought; thought may be regarded as a property of matter."²⁹

Dr. Holmes wittily remarks that Professor Huxley gives bioplasm all that it can bear; from the quotations that I have made, some of us will think that matter is given a good deal more than it can bear.

Every one who has speculated upon the relations of the material to the immaterial, of body to mind, must be conscious of the great difficulties which beset the subject, of the clouds that surround him at almost every step. The results obtained, the conclusions reached by some whose opinions I have quoted, men whose abilities and fame are so great, surely do not commend themselves to most minds as ultimate truths. Nay, I think some of them are open to criticism, if not unequivocal rejection. Very wisely has one of the ablest philosophic thinkers³⁰ of the century observed: "Every one knows that in this dark and cloudy region, which intervenes between the two territories of mind and matter, we meet with some of the profoundest mysteries of our nature. Here we fall in with sleep, dotage, somnambulism, insanity—topics on which little or no light has been thrown. In the mists and clouds which forever brood over this dark gulf, a thousand errors have been lurking. In this border territory there is a continual warfare going on."

I do not propose any extended remarks upon this topic, but shall present some difficulties which are obvious in all schemes of mental physiology, or efforts to interpret the phenomena of mind by physical facts.

Consciousness lies at³¹ the foundation of all knowledge, and physiology ought to give us a definite location for this if it be a pure brain function. Now turn to Carpenter, Huxley, and Ferrier, and after reading their statements as to the matter, take a later writer, Hermann, and see how that which we supposed was knowledge is swept away. Really, we fear consciousness may yet be set wandering through the body in search of a home, very much as the soul³² has:—

"It is also impossible to assign any individual spot in the cerebrum as the seat of consciousness, since cases are known, in connection with almost every part, in which, when that part

was destroyed or wanting, consciousness still remained. Consciousness may still remain after the destruction of one hemisphere."

There are strong arguments to sustain the view that memory, termed by Hamilton the conservative faculty, depends upon material impressions made upon the brain. It is an old theory, but has been presented by Dr. Holmes,³³ of course in a most striking and beautiful garb. Without criticising this material view from a philosophic standpoint, it is enough to repeat the question, Who reads the record? Behind these brain-pages crowded with impressions, there must be an intelligence to read them, or else they are mute and meaningless as a volume of Milton or of Shakspeare would be to a tree or rock.

AN argument for the materiality of the mind has been based upon the fact that an increased quantity of certain materials, urea is the most notable, is eliminated consequent upon mental exertion. Professor Chauffard states that a man in repose passes in twenty-four hours twenty grams .46 of urea; if in energetic muscular exertion twenty-two grams .60 in the same length of time, and finally after intellectual exertion twenty-three grams .88. That is, a great orator, a great poet or painter expends in the exercise of his mind a trifle over one gram more than the hod-carrier or stevedore in the exercise of his muscles. An immortal poem, or painting, or one of Professor Huxley's grand addresses to be had at the rate of fifteen grains of urea for every twenty-four hours!

In regard to the two-faced unity, the Siamese twins, objective and subjective faces of the same fact explaining the relations of mind and body, of the material and spiritual, to my thinking two things are brought together that are essentially disparate and incomparable. Movement and thought cannot be combined in a self-consistent scheme.

When the phenomena of spirit are to be expressed in terms of matter or the reverse, we shall not always have plain sailing. I turn to Haller, that illustrious man of our profession whose fame is for all ages, and I read in his work on Physiology: "For that the nature of the mind is different from that of the body, appears from numberless observations, more especially from those abstract ideas and affections of the mind which have no correspondence with the organs of sense, for what is the color of pride, or what the magnitude of envy?" And Fenelon

has said, ask any sensible person if his thought is round or square, white or yellow, warm or cold, divisible into six or twelve pieces, and he will laugh at you.

I think it will be difficult to persuade physicians who have directed their attention to what are called mental influences in the causation, in the aggravation and in the cure of disease, that there is not something in the human body superior to that body. Jolly³⁴ has given a most interesting lecture upon the "Will considered as a Moral Power and as a Therapeutic Means," in which he adduces cases of muscular paralysis, of convulsive cough, stammering, hysteria, chorea, nystagmus, and one of traumatic tetanus—the last being under the care of Cruveilhier—cases, many of which had been previously treated unsuccessfully by all the ordinary therapeutic means, and which were cured by the exercise of the will.

Sir Benjamin Brodie³⁵ narrates a striking instance of the sense of duty triumphing over pain. Every physician can recall similar instances occurring under his own observation.

I have not time to continue the discussion of this topic, and yet let me quote the utterances of two eminent men in our profession—the one still living, the other deceased a few years ago. The late Sir Henry Holland observed: "I will merely remark, in correction of a common misapprehension, that the further we proceed in unravelling the brain as a collection of nervous fibres, condensed into separate organs for the establishment of their several functions and relations, the more in fact do we detach the mind itself from all material organization." Guenéau de Mussy exclaims: "Combine together oxygen, carbon, hydrogen, nitrogen, phosphorus, as much as you will, and you can make nothing which will be the representative or equivalent of intellectual or moral acts."³⁶

We may weigh the brain, count its billions of cells, measure the rate of sensory impressions or motor impulses, localize cerebral functions, analyze cerebral matter; but after all possible observations, calculations, and analyses, it will always be inconceivable³⁷ that a displacement of molecules, or an undulation, or a vibration, or any mechanical or chemical phenomenon whatever, may be, not the condition of thought, but thought itself. The identity of corporeal and of spiritual phenomena is an affirmation which ought to be consigned to the list of impossible hypotheses.³⁸

Is not the scientist of to-day who explains mental phenomena by mechanical or chemical changes, simply following in the footsteps of the old chemists, who found an explanation for all the mysteries of nature, and even of religion, in salt, sulphur, and mercury?

Physical science cannot express nor explain the mental and moral qualities of man: we cannot conceive that conscience, reason, joy and sorrow, are mere modifications of gray cerebral matter. The common sense of mankind will forever revolt against attributing to such modifications the profound thoughts of Plato, the winged words of Homer, the virtue of Socrates, the eloquence of Demosthenes, the philanthropy of Howard, the inspirations of a Mozart, the sublime conceptions of a Raphael, the faith of the martyr, and the love of the mother.

The problem of Teleology³⁹ commends itself especially to our profession. Even though human beings are but conscious automata, as there is a design, a purpose, and end for which every machine is constructed, so there must be a design in our bodies. The doctrine of automatism is, according to the late Mr. Lewes, the reflex theory legitimately carried out. That theory is used by Hermann⁴⁰ to explain volition, and indeed by others has been made to support the physical basis of mind. To the medical man an argument against the extension given this theory is found in pathology, but its presentation would divert me from my present purpose. It is enough to repeat that human automatism does not materially invalidate teleology.

Neither is the doctrine of final causes destroyed if it gives no explication of all facts and events. Non-recognition of this truth, it seems to me, is an error into which one of our most eminent scientific men has recently fallen.⁴¹ "Just so far," says Professor Newcomb, "as the theologian can reconcile the motions of the planet or the burning of the theatre with final causes, or with a directing hand, so far is he at liberty to reconcile the whole course of nature in the same way." The assertion has been previously made that "the theory of final cause assumes that things have been arranged with a visible purpose."⁴² But when we remember, as taught by Mr. Jevons, that there is probably no science entirely free from empirical and

unexplained facts; and when he further states that logic approaches most nearly this position, but is not free from such facts, the teleologist may easily justify his position in cases of unexplained facts. Because a certain person reasonably skilled in arithmetic cannot solve two selected arithmetical problems, no one would be justified in concluding there is no such science as arithmetic. Furthermore,⁴³ those who maintain that there are final causes in nature are not thereby bound to maintain that there are only such, and that they must always and everywhere prevail over efficient causes.

Teleology is not set aside by the development theory. This theory, finding such strong support in embryology and in palæontology, and accepted, probably by three-fourths of scientific men, although they cannot admit the adequacy⁴⁴ of the causes of evolution advanced by its chief expounder, Mr. Darwin, is not antagonistic to the doctrine of final causes, "and even on the contrary naturally appeals to it, or else the theory of evolution is only the theory of chance under a more learned name."

The truth is, if you deny intelligent design in nature you cannot predicate it of man's works. If the blind stream of physical causation explains the vast and varied phenomena of earth's countless organisms, animal and vegetal, then the acts and works of men are similarly produced. Honor no more the skilful engineer or architect; no more crown the hero with laurels, or gratefully praise the poet, the painter, the philanthropist. All splendid human achievements and noble works are merely reflex phenomena. So, too, burn your scaffolds and tear down your penitentiaries. Individuals are as irresponsible for their actions as the falling stone, the rushing river, the sunshine or the storm.⁴⁵

Nor is teleology to be rejected because of its abuses. Voltaire, who presents an argument⁴⁶ for the doctrine worth any man's reading, refers to some of these abuses,⁴⁷ and while condemning them, defines a final cause as one that acts at all times and in all places. He further declares that one must close his eyes and understanding who pretends there is no design in nature; and if there be a design there must be an intelligent cause; God is.⁴⁸

Time is wanting to present any of the striking evidences of design offered by the human⁴⁹ body, offered in its anatomy, in its physiology and its pathology. Nor is it necessary, for every

physician knows them. Mr. Darwin, whose long devotion to scientific pursuits is so well known, and whose various and extensive observations of nature are so admirable, in referring to certain plants, observes that "the contrivances and adaptations transcend in an incomparable degree the contrivances and adaptations which the most fertile imagination of the most imaginative man could suggest, with unlimited time at his disposal." How much more, then, will the physician in the study of physical man find admirable contrivances and adaptations. And thus we are inevitably led to see the force of Voltaire's argument.

We read in Hippocrates that Medicine is full of reverence for the gods. And again, after most eloquently referring to the changes in nature, alternations of seasons, of day and night, the actions and experiences of individuals, the Father of Medicine declares that everything is accomplished by reason of divine necessity, δι' ἀναγκὴν θεῖαν.

Once more the voice of Galen, meditating upon the structure and functions of the body, is heard: "Compono hic profecto Canticum in Creatoris nostri laudem." Again Sir Thomas Browne speaks: "In our study of anatomy there is a mass of mysterious philosophy, and such as reduced the very heathens to divinity." And then from the same century, prolific of great men, comes the vision of one not so famous in literature as Sir Thomas, but immortal in science—one contemporary with Lord Bacon, and his physician, and who doubtless knew all the great philosopher's censures of the impertinence of final causes in physics, while holding those causes were properly "inquired in metaphysique." The vision is of William Harvey, small of stature, with his keen, black eyes, his olive complexion, and his long hair, changed in old age from the color of the raven's wing to that of snow. Listen to his words in defence of his study of the lower animals: "If you will enter with Heraclitus in Aristotle into a workhouse (for so I call it), for inspection of viler creatures, come hither, for the immortal gods are here likewise; and the great and Almighty Father is sometimes most conspicuous in the least and most inconsiderable creatures." And again, as he studies embryology in the hatching of a chicken: "There inheres in some way or other, in every efficient cause a *ratio finis* (a final cause), and by this the efficient co-operation with Providence is moved."

And what shall be said of his great discovery? It was made under the inspiration of teleology, and using his reason aright. Harvey, says Professor Ackland,⁵⁰ believing in God, believed that there is purpose as well as harmony in the material world. He acted in this faith and, using his reason aright, he made a mighty discovery, which has influenced every biological student to this day, and will influence them to the end of time.

David Hartley tells us that "final causes,⁵¹ *i. e.*, natural good, are the best clew for guiding the invention in all attempts to explain the œconomy of animals."

Sir Charles Bell, rising from his famous researches in the nervous system, as if with oath-like solemnity, lifts up the Human Hand an ever-present, everlasting testimony unto man of Divine Power, Wisdom, and Goodness.⁵²

Could array of grander witnesses and of more conclusive testimony be adduced to prove medical faith in the doctrine of final causes? Are there occasionally those who deny this faith or doubt this creed? That distinguished surgeon of Strasburg, Sédillot, has said: "Some⁵³ physicians, carried away by convictions more impassioned than wise, have found it possible, at rare intervals and in moments of forgetfulness, to doubt the existence of one Supreme Cause, but their vain efforts at revolt against the universal conscience remain without echo and without influence upon science."

⁵⁴Sir Henry Holland and Dr. Prichard have each borne unequivocal testimony to their belief in the existence of the Supreme Being.

Professor Tyndall exclaims: Whence come we; whither go we? The question dies without an answer—*without an echo*—upon the infinite shores of the unknown. How the utterance of this great scientific teacher, utterance bearing most mournful truth, so far as science is concerned, seems almost like an echo through more than twelve centuries of the words of the aged Ealdorman to the King of Northumbria: "So seems the life of man, O King, as a sparrow's flight through the hall where you are sitting at meat in the wintertide, with the warm fire lighted on the hearth, but the icy rain-storm without. The sparrow flies in at one door, and tarries for a moment in the light and heat of the hearth-fire, and then, flying forth from the other, vanishes into the wintry darkness whence it came. So tarries

for a moment the life of man in our sight; but what is before it, what after it, we know not." Human experience and human science are thus at one; known not and unknown are their final utterances.

But, on the other hand, is there from the study of man no light, though it be faint as the first tremblings of dawn upon black, mist hung waves? We have found in such study that man has a physical nature, in the commencement and continuance of which an idea dominated; that it was a continual creation; that there was an organic unity, and the constant manifestation of a power superior to physico-chemical forces.

Dwelling in this body is ⁵⁵mind, "in its perfection one and indivisible, in the image of its Creator,"⁵⁶ an immaterial, supernatural element. Man⁵⁷ is the only one of all created beings to whom has been given the power of perceiving that he perceives, of thinking that he thinks, of knowing that he knows. There animates this machine a self-conscious and immortal principle, declares Professor Draper; and the eloquent words of Sir Thomas Browne will perpetually recur to the thoughtful mind: "There surely is a piece of divinity in us, something that was before the elements, and owes no homage to the sun." Answering to the vital unity of the body, we find a spiritual unity in the immaterial nature—physiology and psychology have corresponding truths.

Let this body be "blown about the desert dust, or sealed within the iron hills," it does not follow that the love and the hope, the aspiration and the desire, the knowledge, the will, the reason and the conscience—those spiritual elements which defy weights and measures, chemical analysis, and the most powerful objectives—should perish⁵⁸ with the material organization. Certain instincts were given for the preservation of the body, and they rarely deceive or betray their trust. So there are spiritual instincts which, in their up-springing, would seem to promise, as to the ancients the bursting pomegranate symbolized, immortality.

Add to these considerations those which flow from our belief in a Supreme Power, wise and benevolent, as suggested by a study of final causes, and there is something more than an echo from the shores of the unknown. We cannot, we cannot yet believe that man has

— "rolled the psalm to wintry skies,
And built him fruitless fanes of prayer."

Since we last met together, less than a year ago, hundreds of our profession have fallen victims to the pestilence that walked in darkness and wasted at noonday in so many of the cities of the South. Some of those who thus fell in their efforts to save their fellow beings from swift death, were in the meridian of their powers and professional success. Others were in the fair morning, with the promise of long years and the hope of high honors. Can we believe that these heroic men live⁵⁹ only in the memory of their friends? From all the martyr-memories of noble men and women in every age, who counted not their lives dear unto them when principle was at stake, or in sublime self-abnegation sacrificed those lives for kindred, for country, for humanity, there comes a solemn protest against denial of life beyond the grave.

Accepting gratefully all the facts of science, let us beware of rejecting⁶⁰ everything that may not be capable of mathematical demonstration, and compelling our assent by absolute necessity. There may be truths more important, but less open; whisperings of hope that are sure promises of fruition. The poet tells of the sea-shell when shaken and its polished lips applied to your attentive ear,

“And it remembers its august abodes,
And murmurs as the ocean murmured there.”

So if we listen, we may hear the deep but distant murmur of the immortal sea as it beats against the shores of time, ready to bear upon its mighty bosom the children of men from life to life, and the law of Continuity be found as true of the spiritual as it is of the material world.

Happy for us, though, unlike the Thracians, we hold no festivities over the dead, if with something of the glad dream of hope, if not in the glory of triumph, we can adopt the familiar words of our great American poet:—

“There is no death ! what seems so is transition ;
This life of mortal breath
Is but a suburb of the life Elysian,
Whose portal we call death.”

NOTES.

1. PAGE 92, LINE 32.

Stirling, in one of his annotations (translation of Schwegler), remarks that the heresy of the German critics is, perhaps, quite as active in England at present as the positivism of Comte; and further utters the warning exclamation, "Truly, we are on the brink of the most fearful crisis in the world's history."

2. PAGE 92, LINE 36.

Dr. Draper.

3. PAGE 93, LINE 18.

Baring-Gould.

4. PAGE 93, LINE 23.

Alexander Bain.

5. PAGE 93, LINE 24.

See his essay upon "Nature." Take the following extract as a part of the terrible indictment: "In the clumsy provision which she has made for that perpetual renewal of animal life, rendered necessary by the prompt termination she puts to it in every individual instance, no human being ever comes into the world, but another human being is literally stretched on the rack for hours or days, not unfrequently issuing in death."

Physicians know that labor in the vast majority of cases of healthy women, rarely lasts more than a few hours; and that in almost every instance the suffering attendant upon it may be greatly mitigated, sometimes entirely abolished, by the judicious use of an anæsthetic. They know, too, that the mortality, especially the maternal mortality, is very small, and no intelligent obstetrician would say that the mechanism of parturition is clumsy.

6. PAGE 93, LINE 27.

Sic volo, sic jubeo; stat pro ratione voluntas.

7. PAGE 93, LINE 28.

"With the conception of two antagonistic powers, which severally work good and evil in the world, the facts are congruous enough. But with the conception of a Supreme Beneficence, this gratuitous infliction of misery on man, in common with all other terrestrial animals capable of feeling, is absolutely incompatible."—*Biology*. If permitted to criticize the language of such a master as Herbert Spencer, I would ask, How can there be misery to animals unless they are capable of feeling?

8. PAGE 93, LINE 33.

Wedge-wood's "Dictionary of English Etymology."

9. PAGE 93, LINE 36.

Dean Trench, "Study of Words," remarks that some "would fain have us to believe that pain is only a subordinate kind of pleasure, or, at most, a sort of a needful hedge and guardian of pleasure. But a deeper feeling in the universal heart of man bears quite another explanation of the existence of pain in the present economy of the world, namely, that it is the correlative of sin, that it is punishment; and to this the word pain, so clearly connected with 'pœna,' bears witness. Pain is punishment, for so the word and so the conscience of every one that is suffering declares."

10. PAGE 94, LINE 30.

"Patience, endurance, faith in the end designed, a nature purified as by fire, accepting the trial with thanksgiving,—these be facts visible amongst the highest recognizable phenomena offered to our ponderings here below.

"Whoso has looked upon one so proved slowly consuming, with the inevitable grave in view, may have beheld, as it were, the face of an angel, have found the fitting expression for the visible radiance from that suffering body in Paul's temple of the holy one, have received conviction that in such sufferer was happiness ineffable, such as no mundane prosperity could yield, transcending any felt by an emperor in the highest pride of place, the welcomer of kings and kaisers honoring him by visits; for with them a pale figure, with breast battered, blackened and imbrued, rises more tragically than Banquo's ghost to mar the climax.

"Some who may have lost a loved one by cancer, will know that I state a fact. We may accept it and go no further in thought; the evidence of the result being, however, as plain as the trial." (Extract from "Answer to Mr. Lewes's Argument of Infirmary in his Review of the Reign of Law." By Prof. Richard Owen. *Fraser's Magazine*, October, 1867.)

11. PAGE 95, LINE 27.

"The Mystery of Pain." D. Appleton & Co., New York, 1872.

12. PAGE 95, LINE 31.

Principles of Science.

13. PAGE 97, LINE 13.

Had time permitted, it was my intention to include in this discussion a fuller reference to the miseries and to the mortality of man, briefly alluding in such connection to that philosophy with which the names of Schopenhauer and Hartmann are identified, *Pessimism*, of which Caro speaks* as *une sorte de maladie intellectuelle*. It was my wish to show that such philosophy—the last cry of insane and utter despair—has no adequate support in professional experience: doctors, though probably not optimists, are still very far from being pessimists.

* *Le Pessimisme au XXXe Siecle*. Paris, 1878.

Even from human misery, conclusions very opposite to those of Schopenhauer and Hartmann have been drawn. Bulwer has said the discontent of the mortal proves the immortal. And Pascal, thus all these miseries prove man's greatness. They are the miseries of a great lord, of a dethroned king.

When man, either from mental or physical pain, or from weariness of living, deliberately destroys his life, it has been interpreted as an indication of his superiority to animal creation. Bossuet has remarked that to determine deliberately, with clear knowledge and reason to die, notwithstanding all the disposition of the body opposes the design, marks a principle superior to the body ; and among animals man is the only one having this principle.

It was my hope also to refer to the remarkable discourse* of Dr. B. F. Cotting in which its distinguished author ably maintains the thesis, "*Disease is a Part of the Plan of Creation*, one of the myriad expressions of Divine thought." In this discourse Dr. Cotting brings out, with great distinctness, the fact that disease and death were in the earth long before the advent of man, and therefore the *moral* explanation of these conditions, an explanation founded upon a single human transgression, fails. It is doubtful whether many theologians of the present day regard this explanation as valid. I quote from an eloquent discourse by Canon Farrar the following passages : "Ages before the first man, the primeval monsters had torn each other in their slime. For long ages the world had been a theatre of conflict and carnage, of wounds and mutilation ; and naturalists tell us that no armory can compete for variety, for beauty, for polish, for sharpness, for strength, for barbed effectiveness, with the lethal weapons of the fossil world." . . . "Yet this death is but the least dreaded part of the other, that second, that spiritual death which God meant in that earliest warning, 'In the day that thou eatest thereof, dying thou shalt die.' "

14. PAGE 97, LINE 18.

Wordsworth.

15. PAGE 97, LINE 19.

Tennyson.

16. PAGE 97, LINE 34.

"If a piece of mechanism, an instrument, or any contrivance is met with, though the construction be unknown, no one doubts that it is the work of an intelligent being ; and further, that it must have existed as an ideal form in an intelligent mind before it could have acquired an actual form.

"If we would seek to inquire deeper into these phenomena, and the law that governs their production, it would be a vain effort. We have reached the limit of human research ; we touch the veil that hides the infinite from the finite, not to be raised by human hands.

"There is but one conclusion that can be adopted. The ideal plan of the universe, in the minute as in the vast, for each individual as for the whole, must have preëxisted to the creation in the divine mind. The creative idea of the ever-present, all pervading presence of God continues to reproduce and to maintain in existence all created forms, after their original types, by the instrumentality of the forces which God has spread throughout nature." (Dr. Samuel Jackson, Introductory Address, University of Pennsylvania, 1844.)

* Annual Discourse before the Massachusetts Medical Society, May 31, 1865.

17. PAGE 98, LINE 14.

A widow marries, and bears children presenting a striking resemblance to her first husband long since dead.

18. PAGE 98, LINE 15.

See article on Heredité by Aug. Voisin, Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques. To the important statement in the text may be added that which Rush makes as to the moral powers being the last to fail in old age.

19. PAGE 99, LINE 6.

Dr. Robert Barnes.

20. PAGE 99, LINE 11.

"The pain which attends the child during its birth or passage into the world, the separation and death of the *placenta*, by which the child received its nourishment *in utero*, with other circumstances, resemble what happens at death. Since, therefore, the child, by reason of its birth, enters upon a new scene, has new senses, and by degrees, intellectual powers of perception conferred upon it, why may not something analogous to this happen at death? Our ignorance of the manner in which this is to be effected is certainly no presumption against it, as all who are aware of the great ignorance of man will readily allow. Could any being of equal understanding with man, but ignorant of what happens at birth, judge beforehand that birth was an introduction to a new life, unless he was previously informed of the suitableness of the bodily organs to the external world? Would he not rather conclude that the child must immediately expire upon so great a change, upon wanting so many things necessary to its existence and being exposed to so many hazards and impressions apparently unsuitable." Then follows the conclusion given in the text. ("Observations on Man," part second, page 386; first printed in 1749.)

21. PAGE 99, LINE 36.

Prof. Bowen, *Princeton Review*, March, 1878.

22. PAGE 99, LINE 37.

"Omni in re consensio omnium gentium lex naturæ putanda est. Opinio-num enim commenta delet dies, naturæ judicia confirmat." (M. Tullius Cicero, *Quæstiones Tusculanæ*, lib. I, c. 13.)

23. PAGE 99, LINE 39.

Jolly.

24. PAGE 100, LINE 17.

"Biology cannot be reduced to the pure mechanism of matter until it is shown that germs or seeds are simple aggregates, and that the phenomena of the formation of organisms, as well as those of generation, are of the same order as the phenomena of affinity and of cohesion." (Ernest Neville, *Revue Philosophique*, March, 1879.)

25. PAGE 100, LINE 27.

“Now, he who accepts the idea of the existence of vital power as being super-physical, will almost necessarily be led to believe that the creator of such power has attributes infinitely transcending those which any supposed creator of the inorganic only would need. The creator of the living must be ever living, and must possess power to form, guide, govern and vary, which would be useless to one who could create non living matter and its forces. In fact, if we admit that there are living things, still it is not possible to resist accepting the idea of the existence and constant superintendence of an all-powerful influence in nature, such as has been recognized in every age, and by nearly all people regarded as supernatural and distinguished as divine.” (Beale.)

26. PAGE 100, LINE 35.

“La Vie : Etudes et Problemes de Biologie Générale.” Chauffard. Paris, 1878.

27. PAGE 101, LINE 13.

I need not say that these illustrations are used by Fenelon—*De l'Existence de Dieu*. One of them, indeed, Fenelon had adapted from Cicero.

28. PAGE 101, LINE 41.

Sully's “Pessimism,” page 466, where a criticism is made of the *monism* of Mr. Lewes.

29. PAGE 102, LINE 5.

This statement in reference to thought as a property of matter, is quite in contrast with the observation of Pascal: “La matière est dans une incapacité naturelle invincible de penser.”

30. PAGE 102, LINE 19.

President McCosh.

31. PAGE 102, LINE 31.

“Whoso has mastered the elements of philosophy knows that the attributes of unquestionable certainty appertain only to the existence of a state of consciousness so long as it exists; all other beliefs are mere probabilities of a higher or lower order.” (Professor Huxley.)

32. PAGE 102, LINE 38.

The centre assigned the soul, according to Pythagoras, Plato, Cicero, and Galen, was the encephalon; Erasistratus, the meninges; Herophilus, the great ventricle; Servetus, the aqueduct of Sylvius; Arantius, the third ventricle Des Cartes, the pineal gland; Sæmmering, the liquid contained in the encephalon; others, the origin of the spinal cord, the corpus callosum, the corpora striata, etc. Aristotle placed it in the heart, while Empedocles had it circulating in the blood. (Tissot—*La Vie dans l'Homme*.)

33. PAGE 103, LINE 7.

Mechanism in Thought and Morals.

34. PAGE 104, LINE 8.

Revue Médicale, 1875.

35. PAGE 104, LINE 16.

"A barrister of my acquaintance, who afterward rose to the highest honors of his profession, was subject to a neuralgic disease, which so affected him that it often happened when he had to advocate an important cause that he entered the court in a state of most intense bodily suffering. But his sense of duty was greater than his sense of pain, and the latter was almost forgotten as long as the necessity for exertion lasted." (Brodie's "Psychological Inquiries.")

36. PAGE 104, LINE 31.

I might add to these testimonies that of Sir Benjamin Brodie, as follows: "It is to me wholly inconceivable that any exaltation of the known properties of matter should produce the conscious indivisible monad which I feel myself to be. When the materialist argues that we know nothing of mind except as being dependent on material organization, I turn his argument against himself, and say that the existence of my own mind is the only thing of which I have any positive and actual knowledge. I cannot help believing in an external world. Still the hypothesis of its non-existence implies no contradiction; whereas it is as much a contradiction to doubt the existence of my own mind as it would be to doubt that two and two are equal to four."

37. PAGE 104, LINE 36.

Naville, op. cit.

38. PAGE 104, LINE 41.

"The moral and intellectual faculties of man belong to a region for which physical science has no language and no explanation." (*Edinburgh Review*.)

39. PAGE 105, LINE 16.

Mr. Mill, in his "System of Logic," remarks: "The word 'teleology' is also, but inconveniently and improperly, employed by some writers as a name for the attempt to explain the phenomena of the universe from final causes." This criticism seems to me incorrect, for the use condemned corresponds to the etymology of the word, and is consecrated both by time and the judgment of many of the most eminent philosophical writers.

40. PAGE 105, LINE 22.

"Unless one is willing to admit the inadmissible assumption that processes which are not essentially movements of material particles, and the converse, we are compelled to surmise the existence of a connection between the nerve excitations connected with sensation and will, which is analogous to reflex actions." ("Physiology," by L. Hermann, translated by Mr. Gamgee. London, 1878.)

41. PAGE 105, LINE 32.

North American Review, May, 1879.

42. PAGE 105, LINE 39.

The purpose is not always visible, but is it generally visible? Neither misconception nor misinterpretation disproves purpose.

43. PAGE 106, LINE 7.

Janet, "Final Causes."

44. PAGE 106, LINE 14.

Murphy, "Habit and Intelligence," second edition, London, 1879, page 375, observes: "We thus conclude that the time needed for the evolution of the highest forms of life out of the lowest would probably require, on the Darwinian theory, more than three thousand millions of years, while the entire duration of geological time cannot have been more than one-eighth of this."

45. PAGE 106, LINE 30.

The late Professor Herbert, in his work upon "Modern Realism," London, 1879, has ably presented the necessity for recognizing intelligence and purpose in nature, or else denying them to the works of man.

46. PAGE 106, LINE 32.

"Dictionnaire Philosophique."

47. PAGE 106, LINE 33.

Ridiculing these, Voltaire suggests that the nose was made to wear spectacles, the feet shoes. Coleridge once said: "You abuse snuff. Perhaps it is the final cause of the human nose." Matthew Arnold, in one of his essays, in like manner remarks, the donkey exists that the invalid Christian may have milk. But the abuses thus ridiculed may have a counterpart, thus, as a witty Frenchman has put it: "I have the toothache; therefore, there is no God."

I find in Dr. Maudsley's "Physiology of the Mind," page 147, the following: "M. Bert has made many extremely interesting experiments on grafting parts cut from the body of one animal on to that of another. For example, he cut off the paw of one rat and grafted it in the flank of another rat; it took root there, and went through its normal growth, beginning to dwindle after a time. Where was the design of its going through its regular development there? Or what, in the temporary adoption and nutrition of this useless member, was the final purpose of the so-called intelligent vital principle of the rat on which the graft was made?" Readers of Vulpian's "Lectures, Phys. du Syst. Nerveux," need not be told that this objection is a repetition of the thought, almost of the words, of Vulpian, and that, as Jowett, referring to the statements of Vulpian, has said, it is directed against the doctrine of *the vital principle*, rather than against *final causes*. Suppose the tail or paw of one rat transplanted to another rat does grow in its abnormal situation, grow uselessly and injuriously, must God make exceptions to a general law in order to guard against the cunning experiments of ingenious physiologists and the adroit arguments of not less ingenious logicians?

48. PAGE 106, LINE 38.

I introduce the statements of Voltaire, partly to correct the notion that teleology belongs exclusively to theologians. It is a question for all intelligent persons, and a question of philosophy, not solely of theology. The scientist, because he does not use the doctrine in his methods, has therefore no right either to deny its reality, or to consign it to the sole custody of theologians.

49. PAGE 106, LINE 40.

Even Mr. Mill remarks: "The human body, for example, is one of the most striking instances of artful and ingenious contrivances which nature offers."

50. PAGE 108, LINE 3.

The Harveian Oration, 1865.

51. PAGE 108, LINE 8.

Op. cit.

52. PAGE 108, LINE 14.

The following passage from Sydenham is of interest in connection with this topic. I quote from page 76 of the translation of his work published in 1711: "In the last Place, I will add only this short Note, lest perchance any one should wrest my Opinion by a sinister Interpretation, or at least, not thoroughly understand it, *viz.* That in the preceding Discourse I often use the Word Nature, and attribute various Effects to her, as if I would represent under this Title some one thing subsisting of it self, and spread every where through the whole Machine of the World, which being endued with Reason, governs all Bodies, such a Thing as some of the Philosophers seemed to think was the Soul of the World. But as I do not affect novelty of Things, so neither of Words; and therefore I use in these Pages the ancient Word indeed, but in a sense, unless I am deceiv'd, both sober, and not only understood, but also used by the best Men; for as often as I mention Nature, I mean a certain complex of natural Causes, which are govern'd by the best Counsel in performing their Operations, and accomplishing their Effects, tho' they are without Reason, and destitute of all Skill, *viz.* supreme Deity, by whose Power all Things are produced, hath so disposed all Things by his infinite Wisdom, that they betake themselves to their appointed Functions, doing nothing that is vain, but that which is best and fittest for the whole Fabrick of Things, and their own private Nature, and so are moved like Engines, not by their own Skill, but by that of the Artificer."

The illustrious Boërhaave might be referred to as also believing in a Divine Order, yea in a Divine Providence. In his seventieth year, when in his last illness, which was both very painful and protracted, he wrote: "Patienter expectans Dei jussa, quibus resigno data; quae sola amo, et honoro unicè."

53. PAGE 108, LINE 19.

Gazette Médicale de Strasbourg, 1855.

54. PAGE 108, LINE 25.

Sir Henry says : "The 'single' fact and 'great truth' is that of one Almighty cause, a conclusion to which we are irresistibly carried forward from every side ; surmounting in this inference those intermediate gradations of existence and power, which are too dimly seen to be rightly apprehended by the faculties of man in his present state of being."

"The whole universe displays the most striking proofs of the existence and operations of intellect or mind, in a state separate from organization, and under conditions which preclude all reference to organization. There is, therefore, at least one being or substance of that nature which we call mind separate from organized body, not only somewhere, but everywhere." (See introduction to Prichard on "Nervous Diseases.")

55. PAGE 109, LINE 12.

The following is an extract from the famous Hunterian oration of the late Mr. Lawrence :—

"Where shall we find proof of the mind's independence of the bodily structure ? Of that mind which, like the corporeal frame, is infantile in the child, manly in the adult, sick and debilitated in disease, frenzied or melancholy in the madman, enfeebled in the decline of life, and annihilated by death."

In the last clause Mr. Lawrence assumed one of the points at issue between the materialist and the spiritualist. But it is impossible to prove the assumption, viz., the annihilation of the mind at death.

Futhermore, the spiritualist would answer that the immateriality of the mind is not necessarily disproved by its present dependence upon the bodily structure. It is quite rational that the child's mind, like the child's muscle, should be that of a child. The difference is vast between the locomotive of to-day and the locomotive first invented. Is the difference between the mind of the adult and that of the child any greater ? The complete formation and the accurate working of all its parts, is essential in every machine, complex or simple, in order that human intelligence may obtain from it its best results. And so of the instrument which the mind uses. Not even a Mozart could evoke music from untuned cords. Let the brain be disordered,

"Now see that noble and most sovereign reason,
Like sweet bells jangled, out of tune and harsh."

Very frequently do we find the mind even in an enfeebled body, revealing unwonted vigor. Many famous names in art and in literature, in poetry and in philosophy, have been those whose merely physical powers were inferior, and who bore a heavy cross of sickness and of suffering. Coleridge in his *Table-Talk* remarks : "Illness never in the smallest degree affects my intellectual powers. I can *think* with all my ordinary vigor in the midst of pain ;" Extreme old age does not always reveal itself in failing intellect. Sometimes in the very article of death, sublimer thoughts are uttered than ever were conceived or expressed in the full vigor of life.

Quite in contrast with the teaching of Mr. Lawrence is the following from Prof. Jaumes, *Montpellier Médicale*, 1860 : "Thought, sentiment, will, do not imply any notion of number, of extent, of motion, and can, ought to, survive the body. . . . A spirit is more than a creation of God, it is an emanation from God himself ; it participates, doubtless in an inferior degree, but it participates in the Divine nature ; it is free, it loves, it knows itself and forms some conception of the Infinite Being from whom it came, and to whom it ought to return."

56. PAGE 109, LINE 13.

Ruskin.

57. PAGE 109, LINE 14.

Flourens.

58. PAGE 109, LINE 30.

Even Cabanis has said: "It is impossible for us to affirm that the dissolution of these organs involves that of this moral system."

Moreover, if the argument seems imperfectly presented, and I know that it is, let me request the doubter to read the page in Coleridge's *Literary Remains*, entitled *Death and the Grounds of Belief in a Future State*.

59. PAGE 110, LINE 8.

Even where no glory of sacrifice transforms the death-bed into an altar, our hearts would have us believe that he who breathes his last is only departing, not dying save as to his physical existence. Very truly has George MacDonald said, speaking for the moment from a purely materialistic side, *Paul Faber, Surgeon*: "What man can learn to look upon the dying as so much matter about to be kneaded and remodelled into a fresh mass of feverous joys, futile aspirations, and stinging chagrins, without a self-contempt from which there is no shelter but the poor hope that we may be a little better than we appear to ourselves."

A few years ago the celebrated Pasteur, distributing prizes at the college he had been educated, in the course of his address, uttered these memorable words: "C'est insulter au coeur de l'homme que de dire avec le materialiste, la mort, c'est le neant!"

60. PAGE 110, LINE 16.

If the position here taken seems to any one unsound, let me remind the objector that it is similar to that of many eminent philosophical thinkers; especially it is the same as that of Professor Acland, in the *Harveian Oration** previously referred to.

"If physical science can put its fingers on nothing but a series of sequences, it merely proves that science is not philosophy, and is altogether a subordinate affair." (Prof. Blackie.) Indeed, in regarding the limitations of human knowledge, made by some writers upon science at the present day, one is reminded of the advice of the Geometer in Voltaire's *l'Homme aux 40 ecus*: "I advise you to doubt everything, except that the three angles of a triangle are equal to two right angles, or that two triangles having the same base and the same height are equal, or similar propositions; for example, two and two make four." This Geometer would have been a high priest in the temple of Agnosticism.

I cannot forbear quoting, in concluding this note, the following from an Oxford lecture delivered last year by Mr. Ruskin: "Of the dignity of physical

* Page 73.

science, and of the happiness of those who are devoted for the healing and the help of mankind, I never have meant to utter, and I do not think I have uttered one irreverent word. But against the curiosity of science, leading us to call virtually nothing gained but what is new discovery, and to despise every use of our knowledge in its acquisition ; of the insolence of science, in claiming for itself a separate function of that human mind which, in its perfection, is one and indivisible in the image of its Creator, and of the perversion of science, in hoping to discover by the analysis of death what can only be discovered by the worship of life—of these I have spoken, not only with sorrow, but with a fear which every day I perceive to be more surely grounded, that such labor, in effacing from within you the sense of the presence of God in the garden of the earth, may awaken within you the prevailing echo of the first voice of its destroyer, ‘Ye shall all be as gods.’ ”

MINUTES OF THE SECTION

ON

PRACTICE OF MEDICINE, MATERIA MEDICA,
AND PHYSIOLOGY.

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PRACTICE OF MEDICINE, MATERIA MEDICA, AND
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TUESDAY, May 6, 1879.

THE Section on Practice of Medicine was called to order at 3 P. M. by the Chairman, Dr. T. F. ROCHESTER, of New York, Dr. W. C. GLASGOW, of Missouri, Secretary.

The reading of the first paper, *Experience of Consumptives in Colorado, and some of the Aero-Hygienics of Elevation above the Sea, with Conclusions*, by Dr. CHARLES DENISON, of Colorado, was postponed, and made the special order of business for Wednesday afternoon.

Dr. N. S. DAVIS, of Illinois, read a paper on *Clinical and Meteorological Records*. On motion, it was referred to the Committee of Publication.

On motion, the Section adjourned.

WEDNESDAY, May 7, 1879.

The Section was called to order by the Chairman, Dr. T. F. ROCHESTER, of New York, at 3¼ P. M.

Dr. N. S. DAVIS, of Illinois, read the paper of Dr. DENISON, which had been postponed on Tuesday.

Dr. A. W. DE ROALDES, of Louisiana, moved that the paper be referred to the Committee of Publication.

Dr. J. H. BROWNRIGG, of Mississippi, moved to amend the motion so that it be referred to the Committee, with the power to eliminate all parts that may already have been printed.

Dr. DAVIS considered such an amendment unnecessary, as such power rested always with the Committee; he hoped the paper would simply be referred to the Committee, as it contained many valuable facts.

Dr. DE ROALDES, in accordance with the request expressed by Dr. DENISON in his paper, offered the following:—

Resolved, That this Section endorses the request of Dr. DENISON, that the officers of the Signal Service Bureau of the United

States Army be requested to forward to the American Medical Association, at nominal cost value, the following maps:—

1. The annual mean proportion of sunshine for the whole United States and territories, properly stated in color, to graphically indicate distinct variations in amount.

2. Four maps giving the actual humidity, in the average grains of vapor per cubic foot of air, for each of the four seasons—the same to be shaded in color, to represent variations of one grain of vapor.

Resolved, That “the Secretary transmit to the chief officer of the Signal Service Bureau, United States Army, this resolution of the Section on Medicine.”

Resolved, “That these maps, when obtained, be added to the paper of Dr. DENISON” in the Transactions.

The next paper was read by Dr. L. D. BULKLEY, of New York, on *The Use of Water in the Treatment of Diseases of the Skin*. It was discussed by Drs. SHOEMAKER, of Pennsylvania, Dr. PORCHER, of South Carolina, and Dr. WESSELER, of Missouri.

The paper was referred to the Committee of Publication.

Dr. T. B. LESTER, of Kansas, having been called to the chair, the Secretary read the communication from the general session in which the address of Dr. T. F. ROCHESTER was referred to the Section on Medicine for action.

The address was discussed by Dr. LYON, of Louisiana, Dr. HOPKINS, of Georgia, Dr. WESSELER, of Missouri, Dr. PORCHER, of South Carolina, Dr. DE ROALDES, of Louisiana, Dr. SHOEMAKER, of Pennsylvania, and Dr. ROCHESTER, of New York.

On motion of Dr. HOPKINS, it was referred to the Committee of Publication.

The Section adjourned.

THURSDAY, May 8, 1879.

The Section was called to order by the Chairman, Dr. ROCHESTER, at 3¼ P.M.

Dr. G. F. COOPER, of Georgia, read a portion of his paper on *Veratrum Viride and its Uses*. After discussion of the paper by Dr. N. S. DAVIS and others, it was referred to a sub-committee for examination.

Dr. W. C. GLASGOW read a part of his paper on *Plastic Bronchitis*, which was referred to a sub-committee.

Dr. G. F. COOPER having been called to the chair, Dr. SHOEMAKER read his paper, which was referred to a sub-committee.

The Section then adjourned *sine die*.

ADDRESS IN PRACTICE OF MEDICINE, MATERIA MEDICA, AND PHYSIOLOGY.

By THOMAS F. ROCHESTER, M.D.,

BUFFALO, N. Y.

THE limitation of epidemic pestilential disease is at all times a question of intense interest to every thoughtful sanitarian, and never more so than at present, when the vivid remembrance of last year's fearful visitation of yellow fever is but too fresh in the minds of all.

Avoiding its usual selection of localities, the cities of the Gulf of Mexico and of the southeastern seaboard, it swept the towns on the banks of the Mississippi and its tributaries with an intensity, virulence, and fatality never exceeded in any locality. Neither acclimation nor previous attack nor race afforded any immunity, the generally accredited exemption of the negro not holding good. No pen can portray the suffering, horrors, and privations experienced, although many vivid pictures were drawn of the dread realities.

A field for philanthropy of the highest order was opened, and it was exercised in a manner most creditable to the human heart. Brave men and devoted women sacrificed themselves by the thousand in extending relief to their fellows, and the clergy and the medical profession especially contributed most largely, by their labors and exposure, to the number of self-immolated victims. The heart of the whole nation was stirred, and, when the smitten brother appealed for help, money poured in like water from a flowing stream. No place was too remote, too poor, or too small to proffer its aid, and, as the cry extended across the sea, succor came from London, Liverpool, Paris, and other European cities, including Stamboul—even the distressed Ottoman gladly parting with some portion of his scanty means for the cause of common humanity.

Of what avail was all this treasure? It buried the dead, fed

and clothed the destitute, and paid some of the necessary incidental expenses caused by the plague. It could do little else, for the disease held its dire sway and was but little influenced by medication. In some localities and under some practitioners, therapeutic measures apparently were of avail to a slight extent, but it is not disputed that, as a rule, the malady was uninfluenced by what we call medicine.

The all-important question, then, comes up—Is it possible to ward off the invasion of this pestilence, or to confine it within limits where it has acquired a foothold? To answer this necessitates a brief etiological investigation.

What is its precise and definite origin, like that of many or, more strictly, of most disorders, is unknown; but *where* it is born is known. As surely as cholera is a product of the jungles of India and Burmah, so certainly is yellow fever of West Indian origin. That it is an exotic, as far as relates to the United States, is the opinion of the last National Commission; and that it never originates *de novo*, except in its primal birthplace, whatever elsewhere may be the excesses of heat, moisture, filth, and vegetable and animal decomposition, is almost demonstrated, perhaps established.

As to communicability, it is certainly conveyed from individual to individual, not precisely by what we understand to be direct contagion, but through various media, especially by bed and body clothing, by articles of furniture, by apartments, cars, and steam and sailing vessels, by baggage and by cargoes; and these propagators, deriving from the sick the pestiferous material (intentionally not called germ), hold it with wonderful tenacity and convey it to mankind with intense effect. Of this property there are numberless illustrations; one is selected, to establish the truth of the above assertions:—

In September, 1856, an infected ship, from Cuba, was detained at the quarantine anchorage off Staten Island, N. Y. Several passengers had died, and some were ill on board. The garments and bedding were thrown overboard. Bay Ridge—a delightful suburban neighbor of Brooklyn, the seat of choice country residences—lies directly across the bay, distant about one mile from the anchorage mentioned. The wind and tide deposited a number of the garments, that had been thrown away, on the beach which terminated the lawn of Col. Charles Prince, an old and respected resident. In taking his usual morning walk, he dis-

covered the clothing, and examined it with his cane, not otherwise handling it. He had no suspicion that it came from quarantine, and never saw it again. In four days he was taken ill, and died in a week from yellow fever. The man who nursed him, and who had previously had yellow fever, took away with him the suit of clothes the Colonel was wearing, contracted therefrom the disease, and died. The son and daughter, adults, the Colonel's only children, were also attacked; the son died, and this was the commencement of an epidemic which destroyed many lives in a limited area, but which was stopped by enforced isolation and by destruction of bedding and garments. The clothing which produced all this evil had been saturated with salt water and had been tossed by the waves for more than twenty-four hours before it made its fatal landing.

Dr. Alfred Stillé, in a recent lecture to the graduating class of the University of Pennsylvania, on this topic, says: "As a single illustration of the mode in which it spread, I may cite the case of Grenada, Miss., a town of 2500 inhabitants, of whom 1040 were attacked with the fever, and 326, or more than 30 per cent., died. The fever first broke out in a family of which the mother had been to the railroad depot, to see her daughter off to a neighboring town. The train was from New Orleans, where the fever was then raging, and the mother, it is thought, occupied a seat in the railroad car alongside of her daughter for about twenty minutes, while the New Orleans passengers were taking breakfast."

It is also stated that the disease has a nearly fixed ratio of progress, apart from its infectious properties, moving at the rate of about forty feet per diem from wherever it may be localized. If this be true, it is an important point to be considered, in connection with the established fact that it is arrested by a freezing temperature, indeed by a continuation of a less degree of cold than 32° F., for in Cuba, where there is no frost, it does not prevail in the cooler season of the year.

Medicine will not cure, nor will cleanliness or antiseptics prevent the progress of that disease. Can anything be done, that the horrors of the last and of other epidemics may be escaped in future? If there is any hope of such a consummation, does it not lie in a strictly enforced quarantine? That it need not be distressingly burdensome to individuals, or greatly prejudicial to commerce, is abundantly shown by the fact that it has been

maintained at the port of New York, for the past seven years, by that most intelligent and efficient health officer Dr. S. Oakey Vanderpoel. During this period, many cases of yellow fever have been received and treated at the quarantine hospital, and ships have been held and thoroughly purified and disinfected, both as relates to vessel and inmates and cargo, and have then been discharged from custody and allowed to proceed to the populous city, even in the hottest season of the year, without a single known instance of propagation of the disease. The very mention of the term "quarantine" raises at once a feeling almost of anger in the minds of many. It is called barbarous, ineffectual, oppressive, a relic of ignorance and superstition, and even by some zealots an opposition to the dispensations of Providence. But and until something as effectual, or more so, is suggested, a deaf ear must be turned to such protestations.

Cholera has been held at bay by quarantine. In 1851 it prevailed in Southern Europe and in Algeria, but not one case occurred that year in Spain, by reason of vigorous *pratique*. Of this the speaker is personally cognizant, having experienced the delights of a most villainous lazaretto—villainous from its want of comforts, but effectual from its restrictions. A year or two later the embargo was less strictly maintained, and cholera ravaged the Spanish Peninsula.

Those of you, gentlemen, whose professional memory extends back to 1832, and those younger, who have made the history of disease a study, will recall the wild and vague notions which prevailed as to cholera. It was a something which always travelled from east to west. Ships sailing from a healthy port encountered it in mid-ocean, and it struck and decimated those on board. Emigrants crossing the plains, bound for the just-discovered El Dorado of the west, had their caravans mysteriously invaded by the fell destroyer. But time and observation dispelled these illusions, and it was found that the disease always followed the highways and byways of travel, that it was always carried by mankind, and, although sometimes long in germinating, and greatly intensified by certain local surroundings, it could always be traced to individuals coming from some point of infection.

If this be true of cholera, and it can be *fenced out*, is it not doubly probable that yellow fever, with its more tangible elements of communicability, may be equally restrained? Few

quarantine stations are such as they should and might be. They should be made as pleasant and as hygienic as location will allow. As they are only required in the summer, the buildings should be of wood, small, isolated, with wide verandas, with all possible provisions for ventilation, drainage, and necessary shade, and for these even suitable tents could often be advantageously substituted. These materials could be destroyed and renewed at but slight expense.

As to direct disinfectants, cleanliness, scalding hot water, possibly ice or ice-water, or an artificial icy atmosphere as suggested by Dr. Davy, of Cincinnati, and sulphurous and carbolated fumigations, may be mentioned. But if ever a true and effectual disinfectant is discovered, it will probably be gasiform or aëri-form—one innocuous to man, but destructive to that disease factor which, indiscernible to any known process of investigation, diffuses itself about, and clings in its invisible and inscrutable nature to almost everything, penetrating plaster and brick and stone—just as the chemist demonstrates to us, by beautiful experiment, their permeability by the common carburetted hydrogen, which we use for illumination.

Quarantine, to be effectual, must have a very wide applicability. It will not suffice to limit it to vessels of foreign ports. It must extend to all conveyances for transportation of passengers and merchandise; it must have relations with municipal, State, and national authority. Without the latter as a directing and controlling power, there cannot fail to be conflict and disagreement. As was here said two days since by the Sanitary Officer of the port of New York, at the meeting of the National Health Board—"Let the federal authority direct the sanitation, and the local powers take charge of all police regulations, and there will be no disturbance or disagreement." A National Board of Health has been appointed by the President, and no better persons to constitute it could have been selected, and it will doubtless be of great service. But it will probably not be vested with sufficient authority; its action will be chiefly advisory.

There should be a National Health Bureau, with extraordinary powers for emergencies, adequate to immediate action, when required. It is at all times as necessary as any of the existing Departments of State, and, if connected with the Signal Service Bureau, as has long been the aim and desire of its chief, Gen. and Dr. Albert J. Myer, there is scarcely a limit to its usefulness.

If the question is raised, let the answer be in the cost of the late epidemic. It has been computed that the actual money loss occasioned thereby amounted to the enormous sum of two hundred millions of dollars. If we admit that the estimate is too large, and cut it in two—how small a portion of this sum would suffice for all quarantine expenses, and for all contingent commercial deficits!

The object of the preceding remarks, if the speaker has not been unfortunate, must be apparent; it is to induce this body to use all its influence toward promoting the establishment of a National Health Bureau, not as an ephemeral health board to meet a sudden emergency, but as a permanent and essential part of a wise and provident government.

HOW TYPHOID FEVER IS PROPAGATED.

The communicability of Typhoid Fever, through water supply tainted by the alvine evacuations of those affected by the disease, is now almost universally accepted as an established fact. It is a point of much interest, not as well known as it should be, that this was first brought to light thirty-five years ago, and published in the *American Journal of the Medical Sciences* for July, 1845, by Austin Flint, M.D., then a resident of Buffalo. But, although distinctly made evident through his researches and investigations, it does not appear that he then recognized or suspected what is now very apparent.

A stranger from Massachusetts died at the tavern in North Boston, Erie Co., N. Y. He had a fever before unknown in that locality. He came on the 21st of September, having been ill for several days and unable to continue his journey. He died on the 19th of October. "Between Oct. 19th and Dec. 7th twenty-eight of the forty-three persons comprising the little community of North Boston were attacked with fever, and in ten instances the disease proved fatal." "Three families only in the settlement escaped." These did not obtain their drinking water from one common source, as all the others did, from a spring on the grounds of the tavern. This being observed by the people, the belief was soon established that the fatal disease was not a fever, but that the spring had been poisoned by one of the exempt families who were at feud with the innkeeper. It was for this reason, chiefly, that Dr. Flint was sent for, and

employed to examine the nature and origin of the disease. From its character, and especially from a post-mortem examination, he was enabled to pronounce it typhoid fever. The water from the spring was sent to competent chemists, who found it remarkably pure, and thus the theory of poison was disposed of; and yet, with the light of the present day, it can scarcely be doubted that it was contaminated with that deadly sept whose effects and whose mode of propagation we recognize but cannot otherwise detect or define.

Dr. Flint's paper is entitled "Transportation and Diffusion of Typhoid Fever." He argues very closely and ably to demonstrate its communicability. He brings out the prominent feature of the supposed poisoned spring, and of those only being taken ill who drank from it. How narrowly did he escape a grand discovery! But the facts which he then brought out and recorded, as now interpreted, are clearly the very first in which there is any mention of diffusion by contaminated water supply.

Within the last ten years many instances confirming this view have been cited from various quarters, and notably the celebrated English dairy case, where the milk was the vehicle of the disorder. The cows having lain upon ground manured from infected vaults, portions of the excrement undoubtedly clung to their udders and thus became directly mingled with the milk. Other explanations have been offered, but this is presumably the simplest and the correct one.

In the *Popular Science Monthly* for February, 1879, Ely Van De Warker, M.D., of Syracuse, N. Y., under the title "Typhoid Fever Poison," reports seventeen cases of the fever in an isolated suburb of the city in which there were but fourteen houses. The first case was imported; thence through the overflowing of the privy in which all the excrement of the patient had been thrown a well became contaminated. All the persons who were taken ill used this well; it was the constant or occasional source of supply of seven of the fourteen families. No cases occurred in the households who did not drink from this well; some cases were developed in every family who drew water from it. The families who escaped were exposed to every other influence but that of this particular well; their own water supply was the same less the privy contamination. It is not unlikely that their own wells received some of the overflow from their own vaults, but, as these were free from typhoid poison, no ill results ensued.

The exempt families mingled with those that were ill, aiding in caring for them. The article is long, complete, and notably fair and candid. The researches were manifestly carried on in an earnest spirit of inquiry for the truth, and the result must be a great reward and satisfaction to the writer, who, in pleasant but forcible style, has, in a perfectly professional manner, given most valuable information to a great number of people whom it never would have reached through the pages of a medical journal.

About eight years since the speaker became satisfied that a source of typhoid fever existed which was little dreamed of, and which at first thought would seem impossible. This source, as he then enunciated it to his home medical society, and not to his knowledge having been before suggested, is found in *ice*. If this idea is thoroughly investigated, it will not appear to be very problematical. In the first place, the poison is not destroyed or impaired by freezing (some one long ago remarked that ice often masks or conceals what it does not kill). Now, whence comes our ice supply? Often from shallow reservoirs, in the midst or neighborhood of large towns, purposely made to receive surface drainage from all around, under the erroneous idea that no harm will ensue, as freezing is supposed to purify and render harmless what might otherwise be objectionable. Great quantities of ice are taken from canals, from creeks, from stagnant ponds, and from streams that are either the natural or artificial recipients of surface drainage, of the outpourings of sewers and of uncleanness from various sources. The danger from ice taken from improper places is not only from that which is drunk, but from its use in refrigerators and preservatories—where milk, butter, fruits, vegetables, and meats are subjected to its saturating influence as it vaporizes. Several instances have fallen under the speaker's observation, where the disease, by the most careful investigation, could not be traced to any other source than this; and, if we accept as a fact the statement first positively made by Budd, in the London *Lancet* for July, 1859, that it never originates *de novo*, but proceeds from a special and specific poison, which is capable of diffusion to a great extent, and which preserves its noxious qualities for a long period, even if buried for many months, we cannot reject the hypothesis of ice infection, and it is hoped that it will be made the subject of very thorough and critical investigation.

A statement is made by Liebermeister, that it is by no means

certain that recent or immediate alvine dejections are more potential or active in extending the disease than those which have been exposed for some time upon refuse heaps, or have been long deposited in privies or buried deep beneath the surface. In England the idea of preventibility of typhoid fever is now so thoroughly established that an innkeeper, who had a guest ill with it, was notified recently that he would be held criminally responsible if any other case could be traced to the one under his roof. This, of course, implied that the evacuations should be so thoroughly disinfected or destroyed that no harm should come from them; it could mean nothing else. It is claimed that the propagating property is destroyed by the application of boiling water to all the discharges, whether in vessels or on the bed and body clothing, which also indicates that other methods of disinfection should be employed. This is easily accomplished, and if earlier known might be sufficient. But in many instances it would not be faithfully performed, and the morbid ejecta would be carelessly distributed in the several receptacles. Can these be made innoxious? It is claimed that they can be, and not only rendered harmless but useful by a process now in operation in England called "precipitation." The following letter on this subject explains itself:—

"COVENTRY, 19th February, 1879.

"DEAR SIR: In reply to your communication, I beg to inform you that the River Purification Association have been treating our sewage for nearly two years in a satisfactory manner. The principle is one of chemical precipitation by sulphate of alumina and other chemicals, and the effluent water or sewage is passed over about nine acres of land as a simple final process of filtration. There are several villa residences adjoining the works and upon the banks of the river into which the effluent passes, but no complaint has ever been made by the occupiers as to any nuisance arising from the works or from the river, although the latter is a very small one, in fact little more than a brook, the sewage in dry seasons being double its volume. I inclose a pamphlet, etc."

The pamphlet alluded to was read before the congress of the Sanitary Institute of Great Britain in October, 1878, by Henry Robinson, F.R.G.S.

The important portion is as follows: "In the course of the writer's experience in advising with reference to precipitation

works and systems, he has seen more and more clearly that sulphate of alumina, aided by milk of lime, proves the most efficient agent to comply with the before-mentioned conditions for purifying sewage. This he has now advanced upon, inasmuch as he has discovered that the efficiency of sulphate of alumina is greatly increased by the presence of some protosulphate of iron, which apparently produces results altogether out of proportion to its chemical equivalents, the proportions varying with the composition of the sewage, but their combination having a marked sanitary and economic advantage The process previously employed gave highly satisfactory results, but the addition of the salts of iron has led to the production of an excellent affluent and at less cost than previously. The employment of this combination has also resulted in the tanks and the sludge being deprived of the slight smell hitherto noticeable at times. The economic results attending this compound system of precipitation will be recognized when the writer states that, at the country sewage works, the purification of the very foul sewage (containing between six and seven grains of chlorine per gallon, and between twelve and thirteen per million of albumenoid ammonia, with a large amount of dye from the manufactories) is now accomplished for £1. 1s. 1*d.* per million gallons. The sewage is equivalent to fifty gallons per head of the population per diem, the minimum flow being two and a quarter million gallons a day. The necessity for the adoption of such a standard of flow cannot be too strongly insisted upon, as the most fallacious estimates about sewage treatment by every system have been arrived at through ignorance or neglect of this essential consideration."

The writer then goes on to explain how, by a process of pressure and filtration, he converts the fluid sludge into a solid and portable form which is readily purchased by farmers for fertilization and without any insalubrious after-effects.

All medical men are familiar with the deodorizing power of sulphate of iron, and if, in the combination described, it becomes a disinfectant, we have what is greatly needed, a very cheap one. It does not appear from the above report that it produces such a solid precipitation as to preclude its use in drains, privies, and sewers. One fact is very evident, that no sewer should be allowed to discharge into any body of water directly, but should empty into tanks or sluices, whence after disinfection it may pass into a pond or stream.

When a startling discovery is made or announced, its influence is apt to be exaggerated, and its application is often extended to subjects with which it has nothing to do. This is doubtless the case with reference to impure water-supply. It is credited with too many evils; but that it will increase and intensify disorders springing from other causes, and propagated by other channels, cannot be doubted.

Of this, a very remarkable illustration has been afforded in an epidemic of diphtheria in Geneva, N. Y., during the past winter. The village is delightfully located on the banks of Seneca Lake, stands high, for the most part, on a bluff forming the western shore, and has always been considered healthy. Diphtheria invaded it during the winter months, and was characterized by unusual tenacity and fatality, subsiding at times, and then recurring with great violence. Investigation as to local causes was conducted by Professor Breneman, of Cornell University, who found that, while the water supply to some portions of the village was of the very best character, as that coming from the "White Spring," and which yielded only $\frac{2.1}{100}$ grain of chlorine to the gallon: the public pump on the corner of Main and Castle Streets furnished $23\frac{3.1}{100}$ grains of chlorine to the gallon; exceeding the average of that furnished by the sewers of Boston and of some other cities. Other pumps and wells yielded 14, 12, 9, 8, 7 grains of chlorine per gallon; and corresponding with the amount of chlorine was always a relative proportionate quantity of albuminoid ammonia and of nitrates. The water from eighteen sources was examined, and thirteen of these were condemned. The disease was more prevalent and much worse in the localities supplied with the bad water than in the others, but was not confined to them. A practical remark of much value, pertaining to the modification and propagation of disease as gathered from the condition of the water supply, is made by Prof. Breneman, to this effect: "It shows the extent of soil saturation, and indicates the condition of the ground, the emanations and exhalations from which taint the air in which the families are obliged to live, and expose them to a constant morbid agency." Is not this a wise and admonitory deduction? and does it not explain the insalubrity of many localities of which a casual examination would not lead to the slightest suspicion?

SANITARIA FOR THE TREATMENT OF PHTHISIS PULMONALIS.

So much interest was elicited last year by the remarks of the speaker's predecessor on "Climatic Treatment of Pulmonary Phthisis," that it is hoped a few words on the same subject may not be out of place here.

It is well known that in Europe mountain resorts for winter as well as summer are now on trial. Those most noted are at Goerbersdorf, Falkenstein, and Davos. A personal friend and patient, who spent nearly two years in Colorado, is now at the last-mentioned resort for the second winter, and has sent so full a description of the mode of life and of its atmospheric surroundings, such as has not been published in any medical work or journal, that deductions have been drawn as to a probable cause of improvement not necessarily dependent upon any special locality, and *this is, systematic and persevering out-of-door exercise in all kinds of weather.* To this there are undoubtedly adjuvants, which will be briefly considered.

The village of Davos am Platz in Switzerland is situated on a large plateau five thousand feet above the sea level, and completely surrounded by mountains, which screen it from high and penetrating winds. Like that of almost all corresponding altitudes, the air is very dry, its humidity being less by two-thirds than that of Nice or Cannes. This gives it a property of electricity or, as it is sometimes called, electric tension, which modifies in a remarkable manner the sensations of heat and cold, persons often sitting in the open air, even after sunset, with the mercury below freezing, without overcoats, without the slightest discomfort—and most of these invalids at that. The daylight at Davos is very short, in the winter the sun overtopping the mountains about 10½ A.M., and sinking behind their summits from 3½ to 4 P.M., but the sunshine while it lasts is very bright, and the heat of its direct rays is intense, rising to 100° or over, and at the same time the temperature in the shade will range from 22° to 30°. The average temperature of Davos for January, 1878, was 16°, most of the nights and many days marking zero or below. To quote:—

"The sun will almost broil one's back while icicles from his breath will form on his moustache and beard, and, changing front, his face will be actually sunburnt; from the constant sun-bronzing to which they are subjected, invalids soon lose all

appearance of delicate health. The food generally is not inviting, nor even well cooked; but an enormous appetite is established after a few days' sojourn, and the rule, to which there are but few exceptions, is that everybody gains more or less rapidly in flesh. The doctors drive everybody out of doors; it is not too much cold but too much heat that they dread.

"You may think there is plenty of time for correspondence, but this is not so; it is walking, sledging, coasting, skating, snow-balling, and eating. An excursion of ten miles on foot soon becomes a bagatelle, to delicate women, who at home could not be induced to walk a twentieth of that distance. In the evenings there are hops, amateur theatricals, and various entertainments; but all by medical direction, of short duration, which is even extended to the Sunday service which is restricted to one session of one hour.

"Persons who have had hemorrhages cease to bleed, coughing and expectoration rapidly diminish, in fact, there will be more coughing in an average country church than in one of our assemblies of invalids. Of course all who come here do not improve; many are brought here in a dying condition, but some of those apparently in that state experience wonderful improvement and pick up to a surprising degree, and, as little or no medicine is administered, the credit must be given to fresh air, locality, and exercise. Those who wilfully devote most of their time to cards, billiards, and saloons, where the air is made close by crowds and tobacco, do not generally improve much in health.

"The local physicians are very cheerful and enthusiastic. They talk a good deal about 'infiltration,' 'consolidation,' 'cicatization of cavities,' etc.; and, as almost all the visitors are or suppose themselves to be consumptive, they catch these and other expressions, and speak so complacently of the changes their lungs are undergoing, that we have to add a large stock of faith and hope to the natural curative properties of this region.

"Hotels and boarding-houses are becoming too numerous. A few years since there were only two. In fact we are beginning to suffer some of the inconveniences that arise from too great an influx of people, and some of the medical men think that it may introduce elements of insalubrity as an almost unavoidable result of too much crowding."

The foregoing abstract of remarks made by an unprofessional but intelligent observer and a self-watchful tubercular invalid,

while it unfolds the daily life and usages, and therefore is here presented, coincides quite closely with the professional papers of Dr. T. Clifford Allbut, of Leeds, published in the London *Lancet* within the past year. One of these commences with these words:—

“For many years I have held that the majority of phthisical patients die of septicæmia, and that the arrest of this daily re-poisoning is a primary object of treatment.” “If there be an antiseptic climate, we may hope to counteract this secondary blood-poisoning by sending our patients to live in it. . . . The aseptic state of the air on alpine heights has been proved by Prof. Tyndall’s experiments at the Bel Alp, but that is insufficiently sheltered. In Davos alone, so far as we yet know, is found an air at once aseptic, bracing, and still.”

There is given here, by imputation at least, the impression, and by other writers the positive statement is made, that *bacteria* have much to do with the march and diffusion of phthisis. It is suggested by the writer that these microscopic entities have altogether too much blame attached to them. They appear to be a component part of the tellurial atmosphere, they are found everywhere, but in varying proportions; and are quite as likely to be nature’s air *scavengers*, as the product and producers of morbid action. They are credited with generating vibriones, micrococci, microzymes, etc. Just now it may seem very heterodox to assert that, like other scavengers of larger size, they simply congregate where is found what it is their office to remove.

In a thoughtful and suggestive paper published in the *American Medical Bi-weekly*, entitled, “A Few Words about Health Resorts,” Dr. F. I. Bancroft, of Denver, Colorado, takes the strong ground that there is no place on the habitable earth that can bear the afflux of large and repeated numbers of tubercular patients without itself becoming a source and propagator of phthisis, no matter what its previous condition as to salubrity may have been, and no matter whether it be high or low, cold or warm, dry or moist. He quotes with approbation the following from the *Medical and Surgical Reporter*: “The time was when phthisis was practically unknown in Madeira, in Naples, in Malta, along the Riviera, and the Upper Nile. Consumptives flocked there in crowds, and now in all these districts the native population succumbs to the disease in quite as large proportion as elsewhere.”

Dr. Bancroft asserts that tubercular phthisis is communicable by the breath and by the sputa and by infection of apartments, and made more so by the insanitation of towns, hotels, and boarding-houses caused by aggregation of diseased persons. It is not news to any here present that this doctrine has long been held in Southern Europe. Dr. Bancroft claims that the advantage of one place over another consists in sparseness of population and the natural pureness of air which is not easily contaminated. He recommends tent and cabin life, with gradual, and so to speak, educated approach to the higher altitudes, and says in conclusion: "In Colorado, and I presume in all health resorts, out-door life is the most powerful factor for good" After all, it is going back to the example set by the first Dr. Parish, of Philadelphia, who, on coughing and spitting blood and emaciating, when a young practitioner, discarded his chaise and made all his visits on horseback, and thereby regained and preserved his health, living to a good old age.

Proper health resorts with judicious regulations will do something, but they are necessarily only for the few. What shall be done for the great multitude who *cannot* leave home? What but less of medication and more of hygiene—hygiene in its largest sense, embracing occupation, habitation, food nutrition, marriage relation, and with all the rest, and above all in importance, systematic and persistent in-door and out-of-door judicious exercise.

Within a few years careful exact pathology has taught us that there are at least three forms of phthisis—the catarrhal, the fibrous, and the tubercular, all until recently embraced under the latter. The first two eventuate in recovery, the last is almost always fatal. As the last is greatly in preponderance, the encouragement we derive from more precise diagnosis is unfortunately very limited.

An apology is due for thus briefly referring to a subject which was brought before you in so scholarly a manner last year, but as little was said about Alpine sanatoria, and as there is much inquiry about them both in and out of the profession, it was thought appropriate to lay the details of the most noted of them before you, and this almost necessarily entailed a few further remarks about phthisis itself.

MATERIA MEDICA.

It is made the duty of the Chairman of the Section of Practice of Medicine to speak of *Materia Medica*, on the hypothesis that drugs constitute the *armamentum medicum*. Happily, this idea is becoming day by day less necessarily thus associated; and it is a common remark that less medicine is given now than formerly, but this is not quite as true as it seems to be.

Many of the so-called "active remedies" are more than ever employed, and in this respect the needed warning of the time is *caution*. Through the wonderful advances in physiology and pathology, and in accurate diagnosis and prognosis, medicine in these matters has become almost an exact science. Chemistry too has become so precise that from form it predicts properties, and, penetrating into the hidden depths of nature, gives us the vital essence of material under the name of active principles. Pharmacy, the handmaid of Chemistry, prepares these alkaloids, these acids, these extracts, these active principles, with practised and dexterous hands, so that neither the eye nor the tongue nor the nose is offended, and the therapist, eager and ambitious, with these at his command, and made wonderfully rapid and energized through hypodermic application, seeks for an immediate and specific effect. He is anxious to be as brilliant and as effective in his medication as he is sure in his diagnosis, and therein lies the danger. Instead of the query, How little medicine will suffice? the more dangerous one, How much will be tolerated? is too frequently propounded.

An abuse followed by much evil, and altogether too common, lies in the fact that reputable druggists in our large cities are flooding the whole country with variously coated pills and ingeniously combined elixirs. A counter loaded with "preparations" from a prominent Philadelphia house, was one of the holiday attractions of a large dry goods store in Buffalo in 1877, the proprietor of which had the saving grace to employ a discarded drug clerk to sell these bonbons of phosphorus, strychnine, arsenic, etc., to people calling to purchase Christmas gifts! This usage of dealing in "preparations" (to many of which even the names of eminent physicians are attached) is only just removed from traffic in proprietary medicines, destroys the usefulness and takes away the responsibility of most individual pharmacutists, and tempts a great many practitioners, as they

look on the list, to prescribe what they never would have thought of, and from which many of their patients derive no benefit, but probably suffer injury.

The eagerness with which new agents are employed is illustrated in the use of jaborandi and its alkaloid pilocarpine. Dr. Fordyce Barker very earnestly protests against their administration in the dropsies and eclampsia of pregnancy, for which they have been highly commended. He bases his opposition on the results of six cases reported by him in the *Medical Record* of March 1, 1879. Five terminated fatally, and one recovered, the latter manifesting no improvement until after the discontinuance of the jaborandi. It is impossible to doubt, after reading Dr. Barker's full and candid report, that the vaunted drug was noxious rather than beneficial.

A new anæsthetic is presented by Dr. George E. Sandford, of Cayuga County, N. Y. He calls it Chloramyl. It is composed of—

Squibb's chloroform, 1 lb.

Nitrite of amyl, 2 drachms.—M.

It is based upon the property of the latter in accelerating the circulation, thus preventing the cardiac paralysis attributable to chloroform narcosis. Cases confirmatory of this view are cited. It is urged that, as nitrite of amyl will rally the heart paralyzed by chloroform, if employed as above it will prevent this accident. The combination is certainly worth trying, with the suggestion—which, it is hoped, will be taken good-naturedly—that the chloroform is quite as necessary as an antidote to the amyl as the amyl to the chloroform.

The *British Med. Journal* of Jan. 25, 1879, presents also an anæsthetic, entitled "Dichloride of Ethydene," reported favorably upon by the Committee of the British Medical Association on the Action of Anæsthetics, and is of the opinion that "it possesses all the advantages of ether or chloroform without their disadvantages. Its odor is agreeable, it produces rapid narcosis without much previous excitement, and its use is rarely followed by nausea or vomiting. It is administered by pouring the liquid on a piece of lint placed in a tumbler, and this held over the mouth and nose. In from eight to twelve minutes complete anæsthesia and muscular relaxation are produced. During the anæsthesia respiration goes on regularly, the pulse is full and slow, and there is no pallor or blueness of counte-

nance. From half an ounce to an ounce of the substance is used."

This is probably similar to the bichloride of ethylene, one of the many anæsthetics tested by Sir James Simpson, who pronounced it safer than either chloroform or ether, but so irritating to the throat that but few could be induced to inhale it. It is described in the *National Dispensatory*.

This part of our subject may well close with brief mention of this valuable work, the rival of the time-honored *U. S. Dispensatory*. It contains over 1500 pages of most valuable matter, is abundantly illustrated with wood-cuts, and is a complete treatise on everything pertaining to the subjects within its scope. It is especially to be commended for the rare and critical judgment of its industrious and erudite authors, Professors Stillé and Maisch, who seem to have most thoroughly investigated all matters presented by them to the medical public.

PHYSIOLOGY.

Perhaps there is no department of medicine that should more properly be termed a science than this. Half a century ago it was a vague, theoretical, sophistical congeries of ideas; now it is a positive enunciation of facts, tintured here and there with hypotheses, as must always be the case where mind investigates the workings of matter and reasons intelligently upon the processes presented to it. Never were investigation and research in this direction more active than at present. The "list of titles of works and papers of physiological interest published in the year 1878," by the *Journal of Physiology*, is in itself a volume. Most of these are by European authors, especially Germans; but our own country contributes no small number of valuable articles, of which there is only time to refer to a few.

Flint, Sr., of New York, and S. C. Busey, of Washington, have each written on Rectal Alimentation, and have shown that nutrition may be maintained for a great length of time by intestinal conveyance,—can it be called digestion? Flint, Jr., is investigating Animal Heat, and the so-called Correlation of Forces, and has advanced some new and ingenious ideas on these subjects. Joseph Jones, of New Orleans, has contributed a most valuable paper on the Detection of Human Blood.

Dr. J. G. Richardson in the *Connecticut Medical Times* of March,

1878, gives a very clear and exact method of "Enumerating corpuscles of the blood." The lamented Dr. L. R. Longworth, of Cincinnati, who died since our last meeting, published in "*The Clinic*" a mathematical demonstration of the reason "why the semilunar valves are three in number." Dr. H. P. Bowditch, in the *Journal of Physiology*, p. 104, discusses the automatic contraction of the heart's apex. Dr. Mary Putnam Jacobi, in the *American Journal of Medical Sciences*, No. CII. gives an interesting account of "Sphygmographic experiments upon human brain, exposed by an opening in the cranium." Dr. J. N. Langley writes on the "Physiology of the Salivary Secretion," and Dr. H. Sewell on "The development and regeneration of the gastric glandular epithelium during foetal life and after birth," both in volume I. of the *Journal of Philosophy*. Dr. I. S. Lombard, of Boston, now in London, is publishing some "Experimental observations on the temperature of the head," which are very noteworthy, and may be continued with much advantage.

In addition to the standard works of Dalton and Flint, Jr., on physiology, Prof. James T. Whittaker, of the Ohio Medical College, has just issued a valuable volume. It is very modestly introduced by its author, who says he endeavors "to put within the reach and comprehension of the first course students the foundation facts and principles upon which the stately edifice of physiology is built." This object is certainly accomplished, but also much more. Its pages will well repay perusal by any physician. Evolution, protoplasm, and conservation of force are prominently brought forward, but in a pleasant and candid manner, and both sides of disputed points are so presented that the student must draw his own inference and conclusions.

Dr. Edward G. Loring, of New York, in a pamphlet of twenty-six pages makes the important and suggestive inquiry, "Is the human eye changing its form under the influence of modern education?" It brings up the natural question as to how many other organs may also be more or less physiologically morbidly modified by the various surroundings and influences of what is called progress in life and habits.

Reference might be made to many other papers, but your time has already been sufficiently occupied, and your attention will only be asked longer and but for one moment to those marvels of science, the telephone and the phonograph. The probabilities of the use of their principles of action in the investigation of

disease and of health cannot now be fathomed, but that their future is one of immense extent of application and of usefulness is beyond all question. Proud should be its citizens, and blessed should be that land, whose sons first chained the lightning, then taught it to write, and now have made it vocal, and have given it a graver's tool, which traces indestructible lines, which may be carried for any time or any distance, as an individual chart, and may after any interval be made to utter not only the words, but the words in the voice of the person it represents.

REPORT ON THE PREVENTION OF BOWEL AFFECTIONS, BOTH IN
CHILDREN AND ADULTS, AS INDICATED BY A COMPARISON OF
CLINICAL AND METEOROLOGICAL FACTS RELATING TO THEIR
ETIOLOGY.

By N. S. DAVIS, M.D.,

CHICAGO, ILL.

THE results of your committee's investigations concerning the keeping of clinical records in regard to the initial development of attacks of acute diseases, and their comparison with coincident meteorological records, have been presented from time to time, and may be found in detail in the volumes of the "Transactions" of this Association for 1875 and 1877. Since the last-named date, additional records of value have been received from Dr. H. Wardner, of Cairo; Dr. Henry R. Rogers, of Dunkirk; and Dr. A. N. Foster, of Chicago; all of which when analyzed and compared with the records of coincident meteorological conditions, lead to the same conclusions as those given in detail in the report for 1877.

As the records thus far have served to develop very clearly and fully the connection between certain meteorological conditions and the prevalence and fatality of Bowel Affections, including Cholera Morbus, Cholera Infantum, and Diarrhœa; and as these diseases are among the most destructive to human life, especially in infancy, it has been thought best to occupy the present report with a more full statement of the inferences justified by the records, and the important practical measures of a preventive and remedial character which they indicate. The general facts in relation to the prevalence and fatality of this group of diseases, are: First, that they are far more destructive to life in infancy than at any subsequent period of human life. Second, that they prevail almost exclusively during the warmest months of the year. Third, that they are far more prevalent over that geographical belt or climatic zone of the earth's surface characterized by a wide range between the extremes of cold in winter and of heat in

summer. In our country, this includes all north of the north line of the Gulf States and east of the Rocky Mountains, and excludes the country bordering on the Pacific Ocean and the Gulf of Mexico. These general facts are proved by statistics of mortality familiar to all. For instance, in regard to the first, we find in the city of Chicago 743 deaths attributed to cholera morbus in 1876, of whom 722 were infants; in 1877, the number was 552, of whom 530 were infants; and the same ratio will be found in nearly all the cities and populous towns throughout the belt or climatic zone indicated.

In reference to the second general fact stated, the same tables of mortality show that almost the entire number of deaths attributed to cholera morbus and cholera infantum took place in the months of July, August, and September. Thus in 1876, the total mortality of children under *two* years of age was in June, 238; July, 669; August, 679; September, 350; and October, 222; the entire excess of the mortality of the months of July, August, and September over the months of June and October being from cholera morbus, cholera infantum, and diarrhœa. The same result is shown every year. Thus in 1877 the total mortality of *children* under *two* years of age, was, in June, 208; July, 700; August, 523; September, 309; and in October, 217.

The third general fact has not been so generally recognized. Yet, if we compare the infant mortality from bowel complaints in the cities bordering on the Gulf of Mexico and on the Pacific coast with those of the Middle and Northern parts of the United States east of the Rocky Mountains, the effect of extremes of the seasons will be very apparent. Thus, according to the statistics furnished by Dr. Henry Gibbons, Jr., Health Officer for San Francisco, in 1873, the ratio of deaths from cholera infantum in children under *two* years of age was in San Francisco only 5 in every 10,000 of the population, and in New Orleans 7; while in the same year it was 24 in Boston, 25 in Brooklyn, 34 in Chicago, and 21 in Omaha.

The foregoing general facts in relation to the mortality from choleraic and diarrhœal affections, are sufficient to show a close relationship between their prevalence and the heat of summer; and to render it probable that high temperature is, at least, a predisposing cause. But our clinical and meteorological records have developed two additional facts of great importance.

First, that the initial symptoms marking the commencement

of each individual case of cholera morbus, cholera infantum, and serous diarrhœa, do not manifest themselves equally from day to day throughout the months of July and August, as the statistics of deaths would imply. On the contrary, the attacks occur in groups, the number of cases multiplying rapidly from three to six or seven days, and then leaving an interval of several days without the occurrence of a single new case. Thus of every hundred cases that occur between the last week in June, in the northern and eastern part of the United States, and the end of July, ninety will have had their initial beginning in groups embracing not more than one-third of the number of days in that month. And of those met with in August and September, more than three-fourths of the cases will have had their beginning during the same group of days in July. Second, a careful examination of the meteorological records kept by the Signal Service Bureau, at the several stations in the northern, middle, and eastern parts of the United States shows that the high temperature of every summer manifests itself in waves lasting from three to twelve or fourteen days, but not often exceeding six or seven days consecutively, during which the temperature continues high both day and night. In the northern climatic belt of this country, the first of these waves of high temperature, continuing day and night for more than three days in succession, pretty uniformly manifests itself between the 20th of June and the 10th of July; and just as uniformly marks the *beginning* of the prevalence of choleraic and diarrhœal affections for that summer. These special waves of heat will generally be repeated twice during the month of July, and, with less intensity, once in August. But they vary much both in intensity and duration in different years. By comparing the clinical records furnished from Omaha, Davenport, Cairo, Chicago, and Dunkirk, concerning the date of the initial symptoms of cases of the bowel affections under consideration, with the meteorological records, I have found the groups of days affording the principal number of attacks to be the same as those included in the special waves of high temperature; thus clearly demonstrating that *continuous high temperature* is, at least, one of the essential elements of *causation* in the production of this class of diseases. I say *continuous* high temperature, because a careful study of the facts shows that it is not simply an extreme heat of one day, or high heat of any number of days attended by cool nights, that determines the

prevalence of these diseases ; but continuous heat for several days and nights, during which the mercury rises above 30° C. during the day, and does not fall below 20° C. during the night.

Details illustrating these conclusions were given in the report to the Section on Practical Medicine, etc., for 1877 ; which, with the further details collected and carefully compared since, fully justify the statement that the chief *factor* in the causation of choleraic and diarrhoeal affections is, *continuous high temperature*, acting upon populations subject to a wide range between the extreme of cold in the winter, and that of heat in summer. And further, that the degree of prevalence and fatality of such diseases will be in direct ratio to the intensity and duration of the heat waves occurring between the middle of June and the middle of August.

The coincident circumstances that give additional efficiency to the action of heat are, stillness or want of currents in the atmosphere and want of ventilation in dwellings ; excess of moisture ; and whatever impairs the general tone of the tissues or increases the sensitiveness of the mucous membrane of the alimentary canal. It is the coexistence of imperfect tissue developments, great susceptibility, and much confinement within the stagnant atmosphere of imperfectly ventilated dwellings, with the seasons of high temperature, that makes the diseases under consideration so much more prevalent and fatal in infancy, than at any other period of life.

If these observations are correct they are of great practical value : first, in pointing definitely to the times when, and in what direction, sanitary measures should be adopted for restricting the number and severity of the attacks ; and, second, the nature of the measures to be adopted, both for the prevention and cure of this class of human ills. It is plain, that, as to the time when preventive measures should be in readiness for practical use, the facts show that they should be in efficient operation coincident with the beginning of the first wave of continuous high temperature in each summer, and that they may be limited mostly to the period of such waves. If the children of the well-to-do are to be sent out of cities and populous towns to elevated, dry, and healthy country districts—if those of the poor are to be provided in parks and barracks in similar country locations as recently suggested by Dr. J. M. Toner and others—or put on board sanitary hospital ships to float in the cooler and purer air of large bodies of water, as

practised to some extent in New York, Chicago, and perhaps other places; any and all these measures to act efficiently as preventives must be in readiness and actually in active operation coincident with the first wave of persistent high temperature, and not, as is too often the case, delayed until the middle or latter part of July, when three-fourths of all who will be attacked during the season have already begun to suffer and many have died. So far as these measures can be made available at the right time, they are efficient and valuable. But from the very nature of human society they can never be made to reach more than a moderate percentage of those who need them most. And as the great leading object is to lessen the effects of continuous heat upon the tissues of the body, a simple process that could be readily executed in every family, however poor, and yet prove of great efficiency, would be to introduce the custom of having all young children freely bathed every warm, oppressive summer evening, and during the special waves of hot weather, after the bath put to bed with a wet towel around the body to protract the cooling process. Such a custom, simple and inexpensive as it may appear, if generally adopted by poor and rich alike, and especially if connected with increased attention to the capacity and ventilation of sleeping-rooms, would every summer prevent a large proportion of the attacks that would otherwise occur; and would consequently greatly lessen the aggregate of infant mortality.

I am aware, that, in making continuous high temperature the controlling factor among the causes favoring the prevalence of diarrhœa and cholera infantum, I am deviating from the opinions and teachings of many, both in and out of the profession. For a long period of time it has been customary to attribute these affections to *teething*, bad fruit, impure milk, sewer and other noxious gases, and overcrowding in populous towns and cities. And doubtless all these agents, except the first two named, do exert some influence as predisposing causes by lessening the power of vital resistance. But I am not willing to place the first two in the list of even predisposing influences. In regard to unripe and spoiled fruit and vegetables, it is sufficient to say that three-fourths of those who are attacked with diarrhœa and cholera infantum are too young to have had anything to do with either fruit or vegetables in any condition. And that the growth of the teeth, or pressure of the teeth on the gums, has any influence is completely negatived by the fact

that in any given community or population there are on an average about the same number of children cutting teeth in winter as in summer—in June as in July, in October as in August—yet familiar statistics of mortality show that in a population of 400,000 or 500,000 not three deaths will be found from cholera infantum during the winter months, while the same population will furnish five hundred or more during the summer. For instance, in the city of Chicago, during the year 1877, only 2 deaths from cholera infantum occurred during the months of November, December, January, February, and March; 8 in April, 6 in May, 23 in June, 246 in July, 163 in August, 69 in September, and 13 in October. The same results appear in the records of mortality every year. Yet thousands of infants are allowed to die almost without treatment of any kind, either preventive or remedial, every summer, simply because the mothers and nurses think the disease to be a necessary accompaniment of teething.

As already stated, the clinical records concerning the date of initial symptoms or beginning of attacks of the bowel affections, compared with the meteorological records in the same localities kept by the Signal Service Bureau, have demonstrated fully the constant coincidence between waves or periods of persistent high atmospheric temperature and the rapid development of those affections. The only question that remains unsettled is, whether the persistent high temperature, occurring in the regions already indicated, acts as a *direct exciting* cause of these affections, or *indirectly* by changing the electric and ozonic conditions of the atmosphere. As the records of the Signal Service Bureau do not include observations concerning the two last mentioned forces, there are not in existence the recorded facts necessary for determining the question.

In referring to the Annual Report of the Board of Health of Michigan for 1878, we find the results of observations concerning the ratio of ozone in the atmosphere, made in seven places in that State, indicated by tables and diagrams constructed by Dr. H. B. Baker; but as the daily record is not given, and the localities are not the same as those where our clinical records were kept, we cannot determine whether there is any fixed relation between the maximum of heat waves and the minimum of ozone. But in comparing Dr. Baker's diagrams representing respectively the range of temperature, atmospheric moisture, and ozone for the year 1877, based on the records of six or

seven meteorological stations in the State of Michigan, the interesting fact is at once apparent, that the maximum of both temperature and moisture was reached on the 1st of July, and was maintained with but little diminution through that month and August, while exactly the reverse was the case in reference to ozone; the diagram indicating the minimum of the latter during the months of July and August.

Five years since the undersigned was appointed chairman of a special committee, whose duty it was to ascertain whether it was not practicable to induce the chief of the Signal Service Bureau of the general government to make the meteorological records at the several stations more valuable to the profession in the study of etiology, by adding a record of the electric and ozonic conditions of the atmosphere; and also to test the practicability of enlisting practising physicians in different localities in the work of keeping accurate clinical records of the date of commencement of all acute diseases, and reporting the same at stated periods to a committee for comparison with the meteorological records in the same localities. The results of the work of your committee have now been given in this and the two preceding reports (see volumes of Transactions for 1875-77). Our request made to the chief of the Signal Service Bureau was very kindly received, and some experiments were made, but such difficulties were encountered as to prevent the establishment of the additional items to the regular records as we desired. But it is only just to say that the chief of that Bureau, and all his subordinate officers, have promptly and kindly furnished to your committee copies of any and all records asked for professional purposes. Notwithstanding the failure to obtain the desired addition to the meteorological records of the Signal Service Bureau, their efforts in the other department of the work assigned have fully demonstrated both the practicability and great importance of establishing the necessary clinical records concerning the date of commencement of all attacks of acute disease. But at the last annual meeting of the American Medical Association a new committee was appointed to hold further conference with the chief of the Signal Service Bureau concerning meteorological records; and as the report of that committee will develop more full and systematic plans for the further prosecution of the whole work, the present committee respectfully asks to be discharged.

EXPERIENCE OF CONSUMPTIVES IN COLORADO, AND SOME OF THE AERO-HYGIENICS OF ELEVATION ABOVE THE SEA; WITH CONCLUSIONS.

By CHARLES DENISON, A.M., M.D.,

DENVER, COLORADO.

“Nature demands and gives—if we can find it—compensation for every drain upon vitality.”—*Lombard*.

No apology is needed for presenting any facts which bring hope for the precarious lives of consumptives.

There is a common warfare throughout our land, forced upon us by this persistent disease, consumption. By its insidious ravages more lives have been sacrificed than by the shot and shell of war.

For nearly six years, in this comparatively new field, I have watched the struggle for life, of a little wing of this consumptive army, “the skeleton brigade,” as I heard a humorous invalid characterize it—and, at your request, I now report to you the conclusions I have reached by observing this running fight.

Had we started out six years ago, with the total number of cases collected, namely two hundred and two, and since kept them somewhat under continuous observation, we should undoubtedly find that more than the *forty* recorded would have succumbed to the enemy. So too might the survivors, though perhaps less in number, have shown a greater contrast between their former morbid state and their present approach to a normal condition; so true it is, that the constructive and destructive processes of nature never cease. Thus continuous observation would have shown us, that, on the principle of natural selection, those who had improved would have been *reconstructed*, while the others would have been *redestroyed*, so to speak, through the tendency to relapse, which belongs to this consuming disease.

Candor compels us to admit that many of those who are heroically warding off an enemy that has a relentless grasp upon their

very sources of life, must yet succumb to this fell destroyer. Consumption is their doom, as it is of more people than any other disease which afflicts mankind.

Since the following conclusions are to show another, a somewhat brighter side of a doleful picture, and are calculated to bring to the Rocky Mountains many selected invalids, who may there become robust and useful members of society, it is well for me to assume the responsibility of these conclusions. This I assuredly do, trusting that the possible charge of an unworthy motive will not be made against one who appreciates the debt of truth a true physician owes to his fellow men and professional brethren.

This responsibility is further assumed, because unwarranted statements have been made by those who write from observations (?) made some thousand or so miles away, and whose deductions from an occasional wind-storm or a daily fluctuation of 25 degrees of temperature, etc., make them deny the healthfulness of Colorado as a resort for consumptives, no matter what the other constituent conditions may be.

This leads to the reiteration of some points touched upon in a former analysis of the attributes of high altitude climates.¹

First. That *cold* is an attribute of *stimulating climates*, and brings favorable results as compared with *warmth*.

This is evidenced by Dr. C. T. Williams's excellent Lettsomian Lectures, wherein he compares the favorable results of 386 winters spent by 243 consumptives in different health resorts along the southern shore of England. He concludes: "These general results assign the largest amount of benefit to the most easterly stations, and follow a course exactly the *reverse* of that of the warmth of the localities, Hastings, the coldest, being at the top of the list, and Torquay, the warmest, being at the bottom."

I append the following table:—

¹ "Influence of High Altitudes upon the Progress of Phthisis." Transactions of the International Medical Congress, 1876, Philadelphia.

TABLE I.

Giving the average temperature, Fahrenheit, by seasons and for the year, taken mainly from army reports and the signal service observations (1 to 6 years), for stations on the Western plains and Rocky Mountains.

Stations.	Elevation.	Spring.	Summer.	Autumn.	Winter.	Year.
Fort Laramie, Wy., . . .	4520	45°	71°	49°	30°	48°
Cheyenne, Wy., . . .	6100	40°	66°	45°	27°	45°
North Platte, Neb., . . .	2845	46°	72°	50°	26°	48°
Denver, Col., . . .	5240	47°	71°	50°	29°	49½°
Fort Wallace, Kan., . . .	3203	51°	79°	55°	32°	54°
Col. Springs, Col., . . .	6030	45°	68°	48°	26°	47°
Hot Sulphur Springs, Middle } Park, Col., }	7730	33°	60°	41°	9°	36°
Pike's Peak, Col., . . .	14,200	11°	39°	31°	3°	20°
Pueblo, Col., . . .	4680	50°	73°	51°	34°	52°
Dodge City, Kan., . . .	2490	51°	76°	55°	32°	54°
Fort Garland, Col., . . .	8000	42°	61°	41°	21°	42°
Las Vegas, N. M., . . .	6420	48°	67°	48°	33°	49°
Sante Fé, N. M., . . .	6860	49°	69°	51°	31°	49½°
Fort Defiance, N. M., . . .	6500	46°	68°	48°	27°	48°
Albuquerque, N. M., . . .	5030	56°	75°	57°	37°	56°
Fort Craig, N. M., . . .	4576	60°	77°	61°	40°	59°
Fort Bayard, N. M., . . .	4450	53°	72°	53°	41°	55°
Fort Fillmore (Merilla Valley, } N. M.), }	3940	64°	81°	64°	47°	64°

Second That *dryness* is a most favorable attribute of the consumptive's resort.

The corroboration of this statement is so universal and complete, and so much in accord with general medical experience, as to need no elaboration here. But chiefly is it shown, by the same distinguished author's analysis of 593 winters, spent by 251 consumptive patients in foreign climates, mainly in the south of France. He concludes: "As to what classes of patients profit most by dry climates, it has been shown, taken collectively, that in all forms and degrees of phthisis, the dry climates are most likely to arrest the disease. . . . As to the desirability of moist climates for consumptive patients, the evidence is decidedly *against* their use in the treatment of ordinary chronic phthisis. The addition of warmth only makes the damp tell more unfavorably, though a strong saline element and invigorating breeze do something to counteract the humid influence.

Still even these do not place a moist climate on the same level as a dry one."¹

The following table will be of interest, as showing the dryness of the interior plateau and foot hills of the Rocky Mountains.

TABLE II.

Showing average inches of rain fall, or melted snow, for seasons and for the whole year.

Stations.	Elevation.	Spring.	Summer.	Autumn.	Winter.	Year.
Cheyenne, Wy.,	6100	4	4	2	1	11
North Platte, Neb.,	2845	7	6	3	1	17
Denver, Col.,	5240	6	5	3	1	15
Fort Wallace, Kan.,	3203	4	6	3	2	15
Col. Springs, Col.,	6030	6	4	4	1	15
Hot Sulphur Springs (Middle } Park, Col.), }	7730	3	5	4	5	17
Pike's Peak, Col.,	14,200	7	10	6	3	26
Pueblo, Col.,	4680	5	5	1	1	12
Dodge City, Kan.,	2490	5	6	2	1	14
Fort Garland, Col.,	8365	3	6	7	3	19
Las Vegas, N. M.,	6420	2	9	5	2	18
Sante Fé, N. M.,	6860	3	7	4	3	17
Fort Defiance, N. M.,	6500	3	6	5	2	16
Albuquerque, N. M.,	5030	1	6	2	1	10
Fort Craig, N. M.,	4576	1	3	3	1	8
Fort Bayard, N. M.,	4450	2	8	4	1	15
Fort Fillmore (Merilla Valley, } N. M.), }	3940	1	4	3	2	10

TABLE III.

Showing the average relative humidity (percentage of saturation) for seasons, and for the whole year, from Signal Service reports for stations named, approximately corrected for elevation.

Stations.	Elevation.	Spring.	Summer.	Autumn.	Winter.	Year.
North Platte, Neb.,	2845	.60	.56	.61	.66	.61
Cheyenne, Wy.,	6100	.53	.42	.49	.54	.49½
Denver, Col.,	5240	.47	.42	.45	.50	.46
Col. Springs, Col.,	6030	.45	.49	.50	.51	.49
Pike's Peak, Col.,	14,200	.73	.62	.65	.76	.69
Dodge City, Kan.,	2490	.63	.61	.58	.61	.61
Sante Fé, N. M.,	6860	.36	.44	.41	.50	.43

¹ "Lettsonian Lectures, On the Influence of Climates in the Treatment of Pulmonary Consumption." By C. T. Williams, M.D., London.

Third. Equable temperature decreases with coldness and dryness, and generally presupposes a very humid atmosphere or a continuous moist wind.

This is a radical statement which necessitates conclusions directly opposed to the opinions held until now by four-fifths of writers on climatology. Not only this, but these conclusions compel the advocates of equable temperature to take issue against the desirability of *cool, dry* climates, for most chronic pulmonary ills.

How very generally is an equable temperature made almost the sole criterion for deciding as to the utility of a given climate! It is recklessly concluded, without going further, that the less the variation in temperature the more favorable the locality for the invalid. It may be so if some selected case is being considered, but the fact remains, that atmospheric moisture is one of the most important producers of an equable temperature, by the capacity moist air has of absorbing the heat of the sun's rays and preventing radiation of the same when once absorbed.

The air is capable of holding moisture according to its temperature; the capacity at zero being one-half a grain to the cubic foot of air, as compared with over 19 grains at 100° Fahrenheit. This great variation in moisture-containing capacity shows how great is our mistake if, in writing an article on "Climates for Invalids," we considered temperature alone.

But *cool, dry* air cannot *hold* moisture, and so it is naturally subject to great daily and seasonal fluctuations in temperature. The sensible effect of cold upon the human organism is so generally augmented by the amount of absolute atmospheric humidity, that these greater changes in temperature in *dry* air are not felt more severely by the great majority of people than the lesser ones in a *damp* atmosphere.

Compare a change of 15° F. in nearly saturated air, the temperature being about 40° above zero, with a change of 20° and the temperature about 10° above zero: Again, compare a change of 15° F., temperature being about 40°, and relative humidity at 80, with twice that change at 10° above zero and the air 40 per cent. saturated with moisture. Yet these are actual changes, and the atmospheric conditions are not unfamiliar. The inhabitant of a section where 40° Fahrenheit is cold, and 70 per cent. of moisture not uncommon in the daytime, and 90 or 100 per cent. at night, would think there was a mistake in the record

of the thermometer; so much would his sensations deceive him should he wake up in Denver and learn that it was 20° above zero there, where the relative humidity is frequently below 10 per cent. in the middle of the day, and rarely above 70 per cent. at night.

The following table will serve to show how dry the air of the elevated inland plains really is, which therefore makes one feel the cold less sensibly.

TABLE IV.

Giving the absolute humidity, i. e., the average grains of moisture in a cubic foot of air, for seasons and for years, at the signal stations represented.

Stations.	Elevation.	Spring.	Summer.	Autumn.	Winter.	Year.
North Platte, Neb., . . .	2845	2.15	4.81	2.51	1.11	2.41
Cheyenne, Wy., . . .	6100	1.60	3.16	1.78	.97	1.80
Denver, Col., . . .	5240	1.76	3.60	1.93	1.00	1.90
Col. Springs, Col., . . .	6030	1.65	3.90	2.02	.98	1.91
Pike's Peak, Col., . . .	14,200	.64	1.74	1.35	.48	.91
Sante Fé, N. M., . . .	6860	1.54	3.64	1.86	1.08	1.84
Dodge City, Kan., . . .	2490	2.69	5.94	2.84	1.30	2.89

We have shown that while coolness and dryness are most favorable attributes, they involve nearly proportionately greater diurnal changes in temperature. The same coolness and dryness are proportionately increased by increasing elevation, to the extent that in a rarefied atmosphere, short of an elevation where human beings begin to suffer detriment, the air is so much clearer that there is a greater change between the temperature in the sunshine and that in the shade at 2 P. M. on clear days than there is between the temperature at night and that in the shade at midday. By simply going into the shade, one is removed from the warmth of the sunshine to a temperature equivalent to that at night.

Why is there so much ado about *equable temperature* when there is so little complaint because of these great changes from shade to sunshine? True, we have it in our power to keep at will in or out of the warmer temperature of the sunshine, while we cannot so well shun the changes which affect all open space at night. Nevertheless, the fact that little injury is caused us

by these changes from sunshine to shade, is patent to all. We are better able to judge of the effect of this change in elevated than in low lying regions. This contrast between the temperature in sunshine and shade, as recorded by an ordinary metallic thermometer at 2 P. M. on clear days, I have found to increase approximately 4° F. for each one thousand feet rise, the influence of wind and cloud being excluded.¹

It is perhaps objected that a long season without rain, as on the coast of California, with the remarkably equable temperature of that locality, is an evidence of a *cool dry* climate. But this very equability is proof of the constant blowing of a *moist wind*. That it is constant, does not need to be proved; but were it not so, the radiation of heat at times from the dry ground near the sea would make that section as parched and warm as the interior valley, where again there are great changes in temperature.

That this wind is *moist* is shown by the Signal Service records at San Francisco, which show usually a monthly range of between 75 and 90 per cent. of saturation. It holds its moisture, having no opposition, until the inland mountains force condensation upon their extended sides and peaks. If the fact of this moisture explains special unfavorable experiences with advanced consumptives, well and good. It is here intended only as a matter of illustration. As to the wind, it is undoubtedly a precious boon to that coast, as it is to many localities the atmosphere of which would hardly otherwise be purified. A moderate amount of wind is healthful.

The amount of wind at several elevated stations is shown in the following table. The fact should be noted as a modifying influence, that the force of the wind is in a measure lessened in consequence of the increasing lightness of the air.

For the purpose of comparison it is interesting to note that in the Statistical Atlas of the last Census of the United States the wind at Cheyenne, Denver, and Santa Fé, three of the sixty-two Signal Service stations represented, was found to blow in about the following proportions: Denver was about the tenth, Santa Fé the sixteenth, Cheyenne the forty-sixth in order, reckoning from the least to the greatest total movement of air.

¹ For fuller description of the diathermancy of the air, as well as the elaboration of the points here stated, see report to the International Medical Congress, and a work on "Rocky Mountain Health Resorts, and an Analytical Study of High Altitudes in relation to the Arrest of Chronic Pulmonary Disease," by the author, soon to be published.

TABLE V.

Giving the average total monthly movement of air in miles, for seasons, and for the whole year.

Stations.	Elevation.	Spring.	Summer.	Autumn.	Winter.	Year.
North Platte, Neb., . . .	2845	7584	7681	5111	4901	6319
Cheyenne, Wy., . . .	6100	5274	6398	6932	7755	7340
Denver, Col., . . .	5240	5070	4142	3856	3908	4244
Col. Springs, Col., . . .	6030	6231	5208	4637	4878	5288
Pike's Peak, Col., . . .	14,200	154011	11,304	12,824	16,233	14,193
Sante Fé, N. M., . . .	6860	6048	5200	4567	4998	5203
Dodge City, Kan., . . .	2490	10,006	9149	6018	6156	7832

Fourth. A long continuance of sunshine is a most fruitful source of improvement to consumptives who live in it.

The contrast between an out-of-door life in the sunshine and that within four closed walls is so great as to force upon us the conviction that consumption is a punishment for the abandonment of a different kind of habitation and mode of life than this era presents. According to the Signal Service reports and records of our army surgeons, variously stationed, the following are the average annual number of clear and fair days at the following stations in Wyoming, Colorado, and New Mexico.¹

TABLE VI.

Giving number of clear and fair days, cloudy days, and (independent of the same) number of days on which rain fell, ditto on which snow fell.

Stations.	Elevation.	Clear and fair days.	Cloudy.	Rain fell on	Snow fell on
Cheyenne, Wy., . . .	6100	284	81	45	53
Denver, Col., . . .	5240	302	63	65	40
Pike's Peak, Col., . . .	14,200	228	137	18	129
Col. Springs, Col., . . .	6030	285	80	47	46
Sante Fé, N. M., . . .	6860	304	61	55	19
Las Vegas, N. M., . . .	6420	278	87	58	23
Fort Defiance, N. M., . . .	6500	312	53	66	25
Albuquerque, N. M., . . .	5030	307	58	48	6
Fort Craig, N. M., . . .	4576	308	57	47	5
Fort Fillmore (Merilla Valley, N. M.), . .	3940	330	35	41	3

¹ Clear days are considered those in which the sun is obscured by clouds one-fourth or less of the time; and fair days on which the obscuration is greater, but less than three-fourths of the time.

Fifth. Do not the houses we live in also intercept the atmospheric electricity intended for our good?

In enfeebled conditions a high state of tension of atmospheric electricity is considered beneficial. The atmospheric electricity of dry sections is very generally positive in quality, and the amount is known to increase with elevation above the sea. As to the desirability of equable temperature, the conclusion of Sir Edwin Lee is a consolation to the invalid in cool, dry sections; *i. e.*, "The frequent changes in temperature promote the disengagement of electricity."

Sixth. *Elevation above the sea*, in such favorably located regions as the plains and foot hills along the eastern base of the Rocky Mountains, *increases the influence for good of these favorable attributes; if, for other reasons*, a given elevation is not proved undesirable. Besides, according to the testimony of Tyndall and Parkes, there is a greater freedom from atmospheric germs, which are believed by their presence to be a fruitful cause of irritation or disease. We have been considering all the time a complex subject—this question of elevation—and *the more we increase it as a remedy for disease the more we must qualify its use*. This qualification may quite as aptly refer to the severity of disease as to the extreme of climate; that is, elevation being considered an extreme attribute, other things being equal, *the severer the disease the less extreme should be the elevation*.

Seventh. *The lessened atmospheric pressure, aside from its being an index of change in climatic conditions, is also a measure of unique physical effects upon the human organism which are positive in their nature.*

They are known through the necessity to breathe a proportionate volume of air to the quantity of oxygen necessary to properly sustain life; resulting in an *activity* and *profundity* of respiration, with proportionate greater expansion of the lungs, which is unmistakable beyond contradiction, and cannot be accounted for by the greater purity of the air and the freedom from injurious atmospheric germs which elevation insures.

True, the freezing of the air at night during the colder half of the year, and the noonday showers which in summer accompany or follow the expansion of air from heat in dry elevated regions, clear the air of destructive germs and wash it free from

injurious ingredients. That providential circumstance, however, does not explain effects due to a change in atmospheric pressure. Why, for instance, will the eagle and condor flourish at an elevation where the dove and birds of proportionately smaller lung capacity will perish? Why, with a continued decrease of atmospheric pressure, is a point reached where human life is soon imperilled, while a less elevation gives proportionately less severe and longer delayed results? Why is there quite uniformly an increase in the chest measurements of those feeble-chested invalids who have improved in high altitudes? Why do spirometrical records, as Parkes avers, decrease as a person ascends, or increase as one descends, as I have witnessed with those coming into my office from the mountain sections? Or why may a mountain life check vicarious issues, etc., which arrest had not occurred in the denser air of the lowlands?

Eighth. It has to be admitted that *a certain elevation gives an approximate immunity from phthisis*, and that this point is higher up, the nearer we approach the equator.

The latter part of this statement has been claimed to invalidate the idea of mechanical force, due to lessened atmospheric pressure, having an influence upon the respiratory organs. But we must not lose sight of greatly modifying circumstances, due to a change of latitude, and acting independent of atmospheric pressure. It is plain that the moisture-containing capacity of the air is augmented, while the oxygen-containing power, desirable coolness, atmospheric electricity, etc., are proportionately lessened by the greater equatorial heat. This must influence the physical and curative effect of the atmosphere, at a given elevation, whatever the atmospheric pressure may be.

For the same reason, that the desirable elevations increase as we approach the equator, the higher regions of Colorado are better suited for many invalids in the summer time than the plains east of the mountains. I have thought that the appreciable differences in these elevations were equivalent to the addition, for summer, of 1500 to 2000 feet, to a given elevation in winter. Let us examine into this question, and see how the desirable coolness we have been led by experience to deem essential, furnishes the residual of oxygen, without which life is impossible.

Dry air weighs more than saturated air, and the cooler it is the heavier it is, as well as drier. According to Mr. Glaisher's

tables, a cubic foot of dry air weighs 606.37 grains at zero, and saturated air weighs 606.03 grains; while a cubic foot of dry air at 100° F. weighs 497.93 grains, and saturated air 486.65 grains. It is evident that the moisture displaces some of the dry air, and with it a proportionate amount of oxygen. But the chief point of interest is, that temperature makes so much difference in the *weight* of the air, and so, of course, in the *actual amount of oxygen contained*. This weight of air, due to cold, must modify the sensible effect of atmospheric pressure so much that it is not strange that the benefits to consumptives, coming from the lowlands, accompany an increasing elevation as we approach, and a diminishing elevation as we recede from the equator.

Ninth. It is averred, as against any immunity and curative influence due to elevation, that mechanics working in confined apartments, in some elevated regions, have contracted consumption.

The inapplicability of this inference leads us to a recognition of about the most important fact this report will contain. It will show us that *effects on life in confined air are no accurate criterion for those in open space*.

Paul Bert,¹ an indomitable experimenter, has, after years of toil, lately won the highest prize given by the French government every two years, namely, 20,000 francs. He sought to obtain the equivalents of elevation, and their effects upon life, by confining birds in jars of different sizes, and charged with air artificially rarefied in various degrees, and noting their duration of life, and afterward analyzing the air remaining. He found that the birds died in times proportionate to the capacity of the jars, and the richness in oxygen of the contained air. He found, after thirty-six experiments and separate analyses, that with each greater rarefaction than the equivalent of 6000 to 8000 feet above sea level, the birds not only died sooner, but the ratio of oxygen remaining to the whole first used increased, while the proportion of carbonic acid as proportionately decreased. The percentage of oxygen remaining increased from .03 at the equivalent of sea level, to .19½ at the rarefaction representing about 34,000 feet above the sea, while the percentage

¹ "La Pression Barometrique. Recherches de Physiologie Experimental." Par Paul Bert, Paris.

of carbonic acid remaining proportionally decreased from 14.8 to .6. This proved that the more rarefied the air, the less oxygen was absorbed, and carbonic acid given off, *a certain quantity of oxygen always remaining*. This residual of oxygen, which he terms the tension of oxygen, he found to be equivalent to $3\frac{1}{2}$ per cent. of the air at sea level. It should be borne in mind that this $3\frac{1}{2}$ per cent. at sea level is equivalent to seven per cent. in an atmosphere rarefied to twice its original volume. While Parkes, in his Practical Hygiene, found that a reduction of oxygen in the air to 14 per cent. did not diminish the amount actually absorbed, Paul Bert shows that there is a loss of an equivalent of four per cent., because it is irrespirable. So, the greater the rarefaction of the atmosphere, beyond the loss of oxygen, which Parkes accounts for as not detrimental, the less will be the residual of respirable oxygen.

Therefore, *the greater the elevation above the sea, the more does ventilation and an out-door life become essential to healthful living*; and, consequently, when objections are made to the curative influence of high altitudes, based upon the injurious effects of life in *confined apartments*, they are unfair and liable to deceive.

Though the above axiom invalidates the application Paul Bert made of his experimental results in confined jars, to the human race, at equivalent elevations; yet an important truth is thus discovered, which is potent enough, could it be universally acted upon, to greatly prolong the lives of consumptives.

Tenth. We are dealing with both an elastic and a complex subject in this question of climates, as modified by elevation.

Human experiences vary almost as much as do the mental and physical states of man, while the ever-changing conditions of the atmosphere show still more the complexity of our theme. This flexibility on the part of man, and variability in the composition of the atmosphere, opens the broad subject of *adaptation*, which has to be recognized as paramount to all others, by all who take part in this discussion. If we lose sight of this necessity, with the fact of complexity, previously mentioned, it is not strange that in our primitive ways of profiting by the experience of others, we arrive at diverse and contradictory conclusions. So it happens that, whatever side of the controversy is taken, some grounds for argumentation are found in the conclusions or writings of others. If this reflection accounts for the seeming undue

reliance which the author places upon his individual observations and experience, even though they contradict others recently expressed, it at the same time forces upon us the need of inquiring *at what elevation above the sea does man ordinarily suffer detriment?*

The question before us is, to say the least, an open one for every healthy individual, because of the varying conditions or idiosyncrasies already suggested. When we come to add the diseased conditions of the lungs—restriction, so to speak, of respiration—the effects of lessened atmospheric pressure, etc., appear to us in increasing variety. In health, for instance, it is interesting to note that the lungs are susceptible to increase in the *frequency* and *profundity* of respiration. This is undeniably proved by the conclusions of Seguin, mentioned by Lombard, that the oxygen consumed in *rest* is as one to three or four in *motion*. Now, both the probable greater activity of the body and the lessened atmospheric pressure, have an influence on this increase in the frequency and profundity of respiration; and so also on the oxygen absorbing capacity of the individual.

Again, a rise in elevation gives a cooler temperature, which insures a proportionately greater amount of oxygen per cubic foot of air—barometrical readings being the same—while dryness, which quality comes with the cold, distance from the sea, etc., of altitudinous districts, also increases the weight of the air as well as the quality of oxygen therein contained.

Lombard says, the deficiency of oxygen due to lessened atmospheric pressure is compensated for by the decrease in temperature up to from 1600 to 3200 feet above the sea during a greater part of the year. This law of compensation of course goes on though in varying degrees as we ascend to greater elevations.

I have adverted to Parkes' conclusions, which show that not till the oxygen in the air was reduced to 14 per cent. was there less oxygen really absorbed in the blood than when the oxygen was in full proportion. Now 14 per cent. of oxygen is approximately equivalent to an elevation of over 10,000 feet above sea level. To this equivalent of 14 per cent. of oxygen, we must apply our corrections, named before, due to colder temperature.

Of course, the effect on animals varies also. Dogs will die at an elevation where the ass will flourish. As a gentleman expressed it to me, "only a jackass and a human being could live" where he had been for the greater part of two years, at an elevation of 13,500 feet.

Jourdanet¹ says the injurious effects of altitude begin to be shown at 2000 metres, or 6560 feet above sea level. As there are, besides the conditions mentioned, modifying circumstances peculiar to the interior of our continent, suppose we conclude that high altitudes—6500 to 10,000 feet above sea level—cause increasing injurious effects in healthy persons. Then we have an approximate criterion for effects to be expected in chronic lung disease. Generally speaking, the more seriously the respiratory organs are impaired, the less the elevation that will produce a given effect; some invalids being able to bear with benefit an elevation which would be a limit, so to speak, for healthy persons, while the great majority would have to be graded at less elevations. In other words, *the prescription of lessened atmospheric pressure, with concomitant climatic variations, must be adapted chiefly to the physical condition of the lungs in each individual case.*

We are now led to a conclusion which I expect will grow out of our future experience in this matter. Of course, the declaration of it now is only approximately accurate. I will, however, venture to formulate it as follows: *The prescription of high altitude climate for a patient should be at an elevation of from one to three thousand feet lower than that at which a somewhat prolonged residence would be injurious to the same invalid. Furthermore, the addition of rarefied air to the climatic prescription for a consumptive is always advisable when the same is not contraindicated for a definite cause.*

I do not flatter myself that adherence will be easily given to such radical statements. For the present leaving them in the crucible of time and experience, we can strive to reach the goal we have thus placed *by a system of exclusion.* We have to determine what classes of cases should not go to a given height above the sea.

This introduces with proper emphasis *the experience of consumptives in Colorado.* The following results in Colorado, Wyoming, and New Mexico—mainly in the vicinity of Denver—I have laboriously compiled from the 260 records I have preserved, during the five years' practice in Denver, ending March, 1879. Very few records have been lost, and only those are excluded from the list which come under the following division, *i. e.*:—

¹ "Influence de la Pression de l'Air sur la Vie de l'Homme." Jourdanet. Paris. Page 300.

First. Twenty-four not heard from after the first examination, whose records are thereby practically valueless.

Second. Twelve whose disease was so *doubtful*, as hydropneumothorax, or *complicated*, as with heart disease or syphilis, that they could not justly be included; and

Third. Twenty-two who were not in Colorado two months or more, and so were unproductive of definite results. Quite a number of these, however, were sent back to lower levels, because the rarefied atmosphere was unsuited to them.

Then of the 202 recorded cases 22 were lost sight of after a time, averaging over six months, 7 being in the first, 5 in the second, and 10 in the third stage, but who are probably now in Colorado, and whose record was complete enough to be included.

As to the severity of these cases there is evidence in favor of these being greater than the average severity, or at least equal to it.

The following is a comparison of Dr. Pollock's subdivision of 1200 cases,¹ as to the stages of disease, with my own, both reduced to percentages:—

	1st Stage. Deposit.	2d Stage. Softening.	3d Stage. Cavity.
Dr. Pollock's . . .	33	32½	34½
My own	37	21	42

There may be need of some explanation why a relatively small proportion of my cases are in the second stage division. I believe the influence of the lessened atmospheric pressure at or above Denver, producing, as it has a tendency to do, a greater expansion of the lungs with *dry* air, shortens the period usually allotted to this stage, and *hastens the transition of the softening portion of the lung to a state of excavation*.

In quite a large proportion, too, of these cases, both lungs were affected; 113 out of 262 as compared with 589 out of 1200 of Dr. Pollock's list. Some of these cases of mine were so far advanced as to warrant no hope whatever; for instance, in two both lungs were in the third stage, one or two were acute tuberculous cases, etc.

The character of the cases is also somewhat indicated by the *amount of inheritance*: reckoning those as having *marked in-*

¹ "Elements of Prognosis in Consumption," by James Edward Pollock. London. Longmans, Green & Co., 1865.

heritance whose mothers died of consumption, also those whose fathers and one or more of the brothers and sisters died of the disease, or those a majority of whose immediate relatives succumbed to this malady; again those as having *slight inheritance* who would seem to have some, but less than the above; and all the others as *no inheritance*,—and we have the following record:—

Inheritance marked	.	.	.	.	.	54
Inheritance slight	.	.	.	.	.	61
Inheritance none	.	.	.	.	.	87
Total	.	.	.	.	.	202

I must add that inheritance has to be acknowledged as a serious feature of this disease. Some of these have inheritance marked to a surprising degree.¹

In my case the *males* more largely predominate over the *females* than in the lists of others; which, in so far as it goes, is a favorable circumstance, there being 148 males to 54 females. This is due greatly to the facility with which men can leave home, take long journeys, and submit themselves to the life of “roughing it,” common in Colorado during part of the year. We will average these cases as to *stage of disease* when they came to Colorado, and *nature of disease*; and will note for each separate division the duration of disease before they came to Colorado, beginning with an evident cause—a pulmonary hemorrhage, pneumonia, etc.; and also the duration in Colorado up to their departure from the State; time when they were lost sight of in Colorado, till death, or till March 1st, 1879. Thus we have *an analysis of 350 years spent by 202 consumptives, with results*.

I will make use of the percentages which represent the proportions to the whole number in each separate division, as this method facilitates the comparison of results. Any necessary explanations will be added as we proceed.

¹ For instance, I have in mind a little boy whose mother brought him to Colorado when he was six years old, at which time I found partial consolidation at one apex. He weighed four pounds at birth and seventeen pounds when four years old. His father died of phthisis two months before this little fellow's birth. Seven out of nine brothers and sisters in his father's family died of the same disease. The mother had a chronic cough before and after the child's birth, and some suspicious symptoms since. Five out of seven of her brothers and sisters have died from consumption. This child is now thriving at the age of 11 years.

Stage of disease.—Seventy-five, or 37 per cent., were in the *first stage*, or stage of *deposit*, when they came to Colorado. These averaged each a year and eight months sick before coming, and a year and seven months in Colorado. Results: Much improved, 85 per cent.; slight improvement, 14 per cent.; and extension and advance, 1 per cent. Of these 75, two have died in Colorado,¹ three after leaving, and 44 are known to be now living in Colorado. Forty-two in the *second stage*, or stage of *softening*, were 21 per cent. of the whole, and averaged one year and five months each sick before coming to Colorado, and have resided there, some over two years. Results: 38 per cent. much improved; 29 per cent. slightly improved; 14 per cent. favorable resistance to the disease, though with perhaps slight local extension; and 19 per cent. extension and advance. Three of these died in Colorado, two after leaving, and 26 are known to be now living in the State. In 85 cases, 42 per cent. of the whole, *excavation* existed on their arrival. These *third stage* cases averaged two years and eight months sick before coming, and one year and eight months in Colorado. Results: 18 per cent. much improved; 26 per cent. slightly improved; 20 per cent. favorable resistance, etc.; and 36 per cent. extension and advance. 16 of these died in Colorado, 14 after leaving, and 34 are known to be resident in the State. Total: 202 patients averaged sick two years before coming to Colorado, and have been living in the State an average each of one year and nine months. 40 of these, or 20 per cent., had died previous to March 1st, 1879—21 in Colorado and 19 after removal—and 104 are known to be living in the State. The results, while they were in Colorado, are as follows: 14 per cent. much improved; 22 per cent. slightly improved; 12 per cent. favorable resistance to the disease; and 19 per cent. extension and advance.

CONCLUSION: Judging from the record and the number who are yet living in Colorado improved or cured, and comparing the results with those of consumptives in the low-lying sections of our land, and this seems to be a reasonable conclusion: *the resort to high altitude climate by a consumptive gives a proportionately*

¹ One of these two died from rupture of intestine. The other, a tuberculous young lady, having gained seven pounds while living on a ranch, riding horseback, etc., became suddenly worse through the meddlesome treatment of a country doctor, who repeatedly applied a sixty-grain solution of nitrate of silver for the relief of an aphonia, for which I had purposely refused to prescribe.

better result the earlier it is undertaken—even more so than is the case with less positive climates or means of cure. The converse of this conclusion should keep the unfavorable *tuberculous* or *rapid* second or third stage cases at medium or low elevations.

Nature of disease.—I cannot believe that post-mortem examination of many cases would verify an exact classification, made at their commencement, into the present various varieties of disease, no matter who may have made the diagnoses. This distrust is not a little strengthened by the thought Dr. Roswell Parke expressed in his "Conspectus of the Different Forms of Phthisis," *i. e.* "The greatest danger for consumptives is that they may become tuberculous." In any case it is true that the differentiation so nicely laid down in the books seems inapplicable to many of these cases because of the complications present at a given time; while in some one instance the character of disease at different periods has seemed to fairly represent separate varieties.

How then, I may be asked, can confidence be placed in a given classification, extending over so long a period of time? Candidly we must admit the many sources of error, not the least of which, I grant, is the incompetency of the diagnostician in the present instance. There are general conclusions to be drawn, however, which, with considerable experience on the ground, may make us quite positive in our views.

In the following classification of our results it is possible that some *catarrhal* cases come under the *inflammatory* group. The diagnosis of the catarrhal variety seems to be of less consequence in the first stage in Colorado, there being less contrast in results then between it and the inflammatory class than in the later stages of the disease. The second or *softening* stage in the other subdivision contributes largely to the catarrhal in this. As it is mainly the prolonged third stage cases which give so large an aggregate of years of sickness in the other classification, they undoubtedly contribute largely to the *chronic tuberculous* in this. I use the word *tuberculous* in a somewhat general sense, as I cannot positively say these were all tuberculous. I have chosen, then, to mass these results under the following heads:—

First: Inflammatory Phthisis, including uncured and chronic pneumonias, many cases of hemorrhagic phthisis, hepatization, and some probably of incipient fibrous phthisis, etc.

Second: Catarrhal, adding scrofulous cases and those complicated with cheesy pneumonia.

Third: Chronic Tuberculous Phthisis, including also the laryngeal variety, and many of the complicated fibrous, tolerated cavity, etc.

Analyses: There were 77 in the *inflammatory* group, or 38 per cent. of the whole. These averaged one year and two months ailing before coming to Colorado, and resided there an average of one year and eight months. The results, as we would expect, were quite favorable: 71 per cent. much improved; 17 per cent. slightly improved; 5 per cent. favorable resistance to the disease; and 7 per cent. extension and advance.

Three died in Colorado, 1 of them from rupture of the intestine, and 1 from intercurrent pneumonia, and 4 after removal. 42 are known to be living in the State.

The 41 in the *catarrhal* group were 20 per cent. of the whole. These averaged about a year and eight months affected before reaching Colorado, and have resided in the State about the same length of time. The results, as will be seen, are comparatively unfavorable: 27 per cent. were much improved; 17 per cent. slightly improved; 15 per cent. favorably resisted the disease; and 41 per cent. suffered extension and advance. 6 of these died in, and 7 out of, Colorado.

The *chronic tuberculous* group included 84, which was 42 per cent. of the whole. These averaged the long time of three years and one month affected before reaching Colorado (many of these had journeyed to other climates in search of health); and have resided in the State an average of one year and ten months up to the limit set, March 1st, 1879.

The results of this class, as compared with the catarrhal group, are very favorable; while the prolongation of life indicated, for such a doomed class of invalids, is considerable. They are: 35 per cent. much improved; 29 per cent. slightly improved; 15 per cent. favorable resistance; and 21 per cent. extension and advance.

Twelve of these died in Colorado and 8 after leaving; and 44, or about half of the 84, are known to be living in Colorado. Some of these, as well as many in the inflammatory group, are excellent examples of what may reasonably be hoped to be *permanent arrest*.

We therefore conclude, from the foregoing analyses, that *the inflammatory group and hemorrhagic cases are most favorably influenced by Colorado climate*; while the influence in the catarrhal and chronic tuberculous classification is much more indifferent.

There is an exception in favor of the fibrous variety, which is quite favorably influenced, even in the third stage, where only a small amount of lung tissue is affected.

But the catarrhal and tuberculous cases, especially with suspicious laryngeal complications, should not resort to great elevations while much lung tissue is actively involved in the disease.

It is of further interest to note that 12 of these cases were sent to a lower level, because the climate of the higher districts became injurious or unsuited to them. Also, that, while eleven went away and did well after leaving, there were 44 who became worse on going to a lower level—mainly to their Eastern homes—and in consequence 28, or 64 per cent., returned to Colorado. The second experience in Colorado of these mentally uncertain cases is usually not as gratifying as the first.

While in Colorado, these 44 favorable cases who went East were: 73 per cent. much improved; 18 per cent. slightly improved; and 9 per cent. favorably resisted the disease. The conclusion is, that *a somewhat prolonged residence is necessary in the climate which gives a certain consumptive the greatest benefit.*

Lack of time, and the fact that this report is already long, prevent the completion of this analysis here.¹

CONCLUSIONS: Aside from, or growing out of, the deductions italicized in the course of this report, there are certain conclusions which I wish to emphasize by a closing mention.

I. The fact, that *cool, dry* climates give the most favorable results in the treatment of ordinary chronic phthisis, brings into such prominence the value of the *dryness* of the air—since coolness promotes dryness—that I will ask this Section, or, if necessary, the Association itself, to request the proper officers of the National Signal Service Bureau to furnish the American Medical Association the following maps, at their nominal cost values; the same to be incorporated in our Transactions in company with this report:—

First. The annual mean proportion of sunshine for the whole United States and Territories; properly shaded in color to graphically indicate distinct variations in amount.

¹ I hope, however, in the work mentioned as now under way, to include analyses as to age, hemorrhage or hæmoptysis, etc.; a description of health stations and mineral springs; an inquiry into the relief obtained by asthmatics, and other subjects, as well as a *chest examination chart* to facilitate the correspondence between physicians who seek, in advance of the invalid's departure from home, the *adaptation of climate* to his needs.

Second. Four maps giving the actual humidity in the average grains of vapor per cubic foot of air for each of the four seasons—the same to be shaded in colors to represent variations of one grain of vapor.

II. Equable temperature is mainly incompatible with desirable dryness, and so, to say the least, is a questionable criterion for deciding upon the superior utility of a given climate over another less equable. Instead of equability as characterizing a climate, those consumptives who can stand it need *stimulation*.

III. Elevation above the sea—location being favorable—increases such desirable attributes as stimulation, dryness, coolness, and diathermancy of the air; but the more we increase it as a remedy for disease, the more we must qualify its use; or the severer the disease the less extreme should be the elevation.

IV. While desirable coolness increases the oxygen-containing capacity of the atmosphere, altitude has a counter influence and necessitates an active out-door life to insure the best results; or again, just as the more an invalid is deprived of his normal breathing capacity by disease, so the more he feels obliged to remain in confined apartments, the more are extreme elevations unsuitable for him.

V. As to treatment, I venture the assertion that, generally speaking, tissue change should be stimulated or hastened in consumptives, according to their ability to bear it. As experience in Colorado proves that altitude hastens tissue change, then the better the resistance is to this change, the more, generally speaking, is elevation indicated.

VI. Many consumptives who visit Colorado need some supervision, hygienic care, and accommodations better suited to their community of interests. This, with the necessity that their lives, elevation above the sea, etc., should always conform to their individual needs, leads me to recommend the establishment of a Trial Sanitarium for them, on a different plan from any existing institution; an aggregation of patients injurious to each other being purposely avoided.

Briefly, the idea should be to put into action the *climbing* treatment, and life among the foot-hills of the Rocky Mountains, under the restrictive and tutative supervision of physicians who control the institution. The object in view should be to admit for treatment only those whose physical condition, etc., offer sufficient hope of favorable results.

Thus a decided success, with selected cases, at, let us say, an elevation of about 6000 feet above the sea, might soon warrant another trial sanitarium on the now dreary plains west of the eastern limit of the short "Buffalo grass," or near the elevation of 3000 to 3500 feet.

As a medical society, as well as an individual, might perhaps be said to "implicate their integrity and disinterestedness" by undertaking such a scheme, an institution of this kind should be wholly under the control of a directory of several physicians, who would formulate government and methods of treatment, officer the institution, etc., and not expect much pecuniary return.¹

¹ Though a life in such an institution would have no attraction for me individually, I would willingly join ten or more physicians interested in the matter in establishing a sanitarium of this character, with the expectation that in three to five years the same would be at least self-supporting.

PLASTIC BRONCHITIS.

BY W. C. GLASGOW, M.D.,

ST. LOUIS, MISSOURI.

I PRESENTED, Mr. President, to this Section, at our last meeting in Buffalo, casts which had been expectorated by a man suffering with plastic bronchitis; the accompanying photograph of the casts was taken a few days after they had been expectorated. Owing to lack of time, I had no history to report, and it is in accordance with the resolution of the Section, as moved by Dr. Rich, that I now report the history and treatment of the case during the past year.

In addition, in order to give more interest to the report, I have endeavored to ascertain, as far as possible, the experience of leading American physicians in the disease. With this end in view, I addressed letters to many of our prominent physicians, in different sections of the country, and have received from the majority most courteous replies.

I have been fortunate enough to collect a few cases which have complete histories; the mass of the testimony, however, relates to fragmentary histories of cases. Still, sufficient has been gathered to show the comparative rarity of the disease, and some of its prominent symptoms.

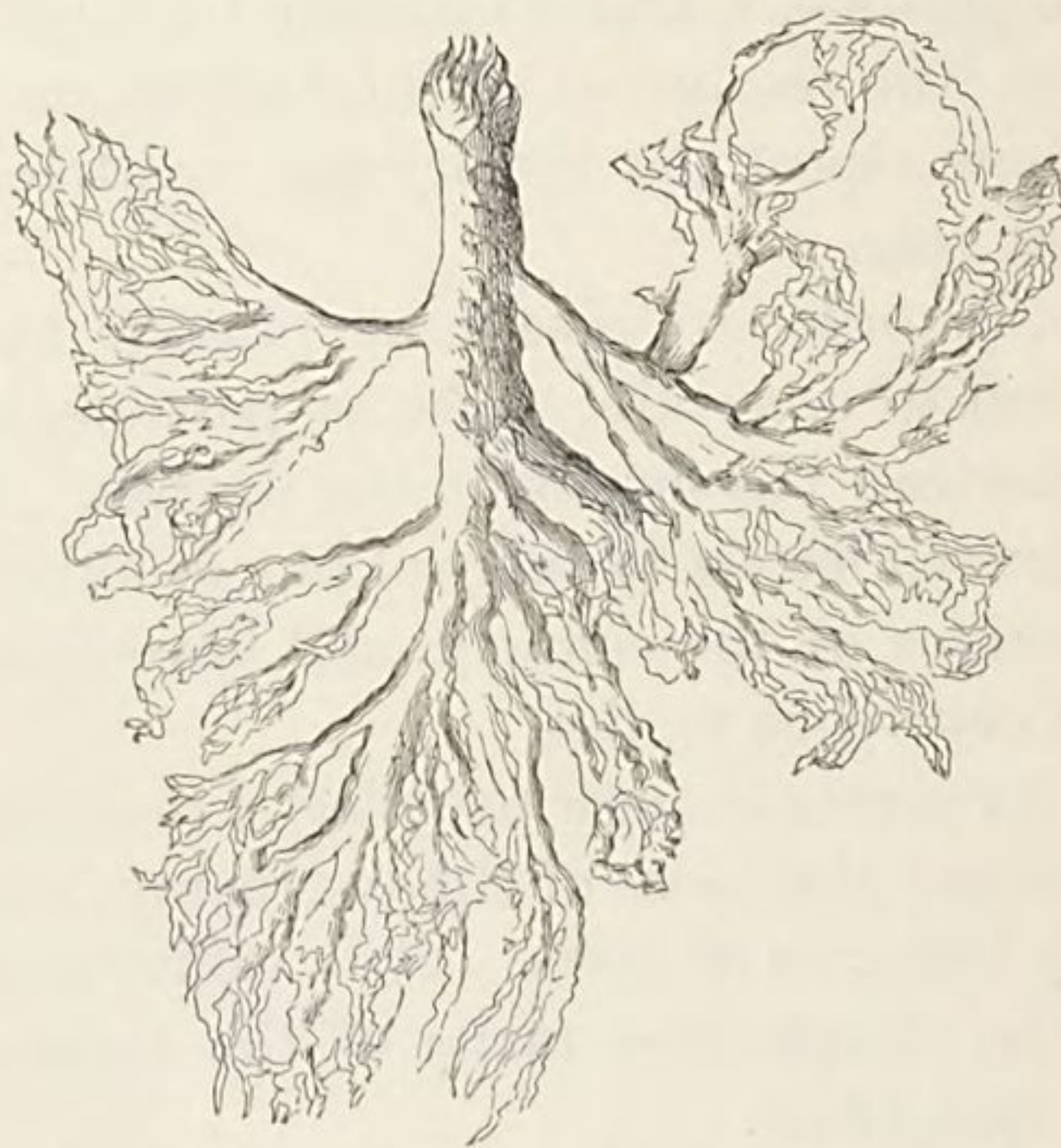
The history of the case which is the occasion of this paper is as follows:—

June 2, 1878, Dr. John Mayger, of St. Louis, brought to my office the patient, John B——, aged seventeen years. He is 5 feet 11 inches high, weighs 133 pounds, is of spare build and somewhat emaciated, having a decidedly anæmic appearance. He is of perfectly healthy parentage; mother and father both living. By occupation he was a farmer, and occasionally worked as a painter.

In early life he had many attacks of spasmodic croup, and at six years of age became affected with a pustular eruption over

the entire body, which continued in spite of treatment for over a year. With this exception, his health has been generally good, until about a year ago, when having fallen from a raft into the water, he took a violent cold and had a cough which lasted about two months. During the following six months he seemed to be perfectly well, with the exception of a slight hacking cough. He then noticed for the first time small bits of cast occasionally in the expectoration. He expresses himself as having felt a tightness or sense of oppression in the chest, or rather a feeling of want of air, which was especially apparent when painting in a close room, exposed to the odor of paints and oils. He also complained of a feeling of heaviness and stupidity, especially in the mornings, which at times rendered him incapable of continuing his work.

Fig. 1.

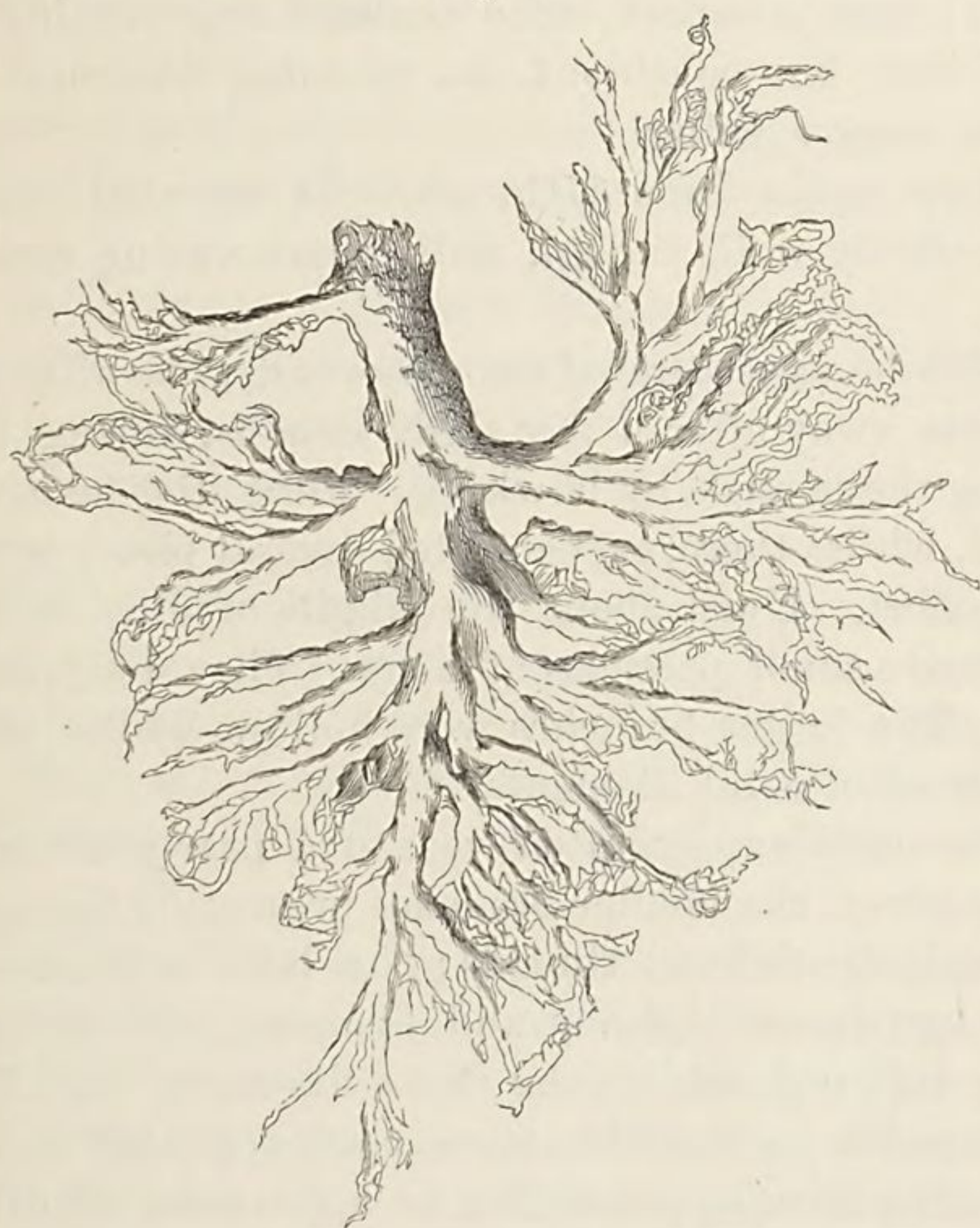


Bronchial cast, reduced one-half, from photograph.

He removed to the country, and in a few weeks noticed the entire disappearance of the fibrinous particles from the expectoration, and seeming return of perfect health. After several months, he returned to the city, and resumed his business as a painter. Bits of membrane or cast again appeared in the expectoration, and the old feeling of stupidity and oppression in the chest again became very marked. He was suddenly taken with a violent chill, which lasted several hours, and this was followed by high fever, continuing nearly twenty-four hours.

During the fever, he had frequent and violent paroxysms of coughing, with an intense feeling of suffocation, or want of air. About 10 P. M., having taken a drink of water, it was immediately vomited, and this was repeated several times. Some two hours later, during a paroxysm of coughing, a large mass was expectorated, which proved to be a bronchial cast (see Fig. 1); he immediately experienced a sense of relief; the tightness of the chest disappeared, the cough ceased, and he slept soundly till morning. Next morning, having taken a cup of tea, he complained

Fig. 2.



Bronchial cast, reduced one-half, from photograph.

of a feeling of nausea and heaviness over the epigastrium; a slight hacking cough came on, and without any effort a large mass arose in his throat, which also proved to be a large cast. (See Fig. 2.) The sense of oppression immediately disappeared, and he felt perfectly well, with the exception of a slight soreness under the middle of the sternum. Physical examination showed percussion sound to be negative; on auscultation, there was found a diminution of the respiratory murmur over

the middle of the left lung, near the angle of the scapula, where a few sub-crepitant râles of rather dry character could be heard. The respiratory murmur over both lungs was feebler than usual.

I prescribed for him ten grs. of iodide of potassium and ten drops of the syrup of iodide of iron, to be taken three times a day. He continued this treatment for ten days, when it was omitted on account of nausea. I then gave him ten-drop doses of the syrup of the iodide of iron, on sugar, twice a day after meals, and in addition ordered an inhalation of the ethereal extract of tar with carbolic acid, to be used every night. He continued this treatment about a month, then omitted the evening doses of iodide of iron, but continued the morning dose and used the inhalation every evening.

I saw him again June 17th, when he reported that he was feeling perfectly well, though still expectorating small bits of casts.

June 19th he expectorated two large casts, one after the other, which came away after a few slight coughs, during the efforts of clearing the nostrils by hawking. June 21st he came to my office, and, whilst there, expectorated several pieces without the slightest effort. Until about the middle of July he continued to expectorate small particles of casts. They disappeared then entirely. The larger branches were hollow, whilst the smaller ones consisted of solid filaments.

The first casts expectorated were of a pearly white color, of firm consistency, the smaller branches presenting the appearance of fine, perfectly defined threads; the later casts showed a decided change in consistency and firmness, the external coats appearing softened, whilst the finer filaments lost their well-defined rounded form, and in some cases appeared as bundles of disintegrating fibrillæ, presenting an appearance similar to that given to the earlier casts after having remained some time in a solution of chloral. This change in the character of the casts, I think, we can truly ascribe to the action of the remedies; whether due to the influence of the iodide of iron or of the inhalations, remains an open question. The iodide of potassium was first given on account of its well-known influence on inflammation of the bronchial mucous membrane. The iodide of iron was added for its tonic effects, and with the view of continuing the influence of the iodine. The inhalations of tar and carbolic acid were prescribed with the hope of their having an alterative

effect, in changing the specific character of the inflammation and preventing a re formation of the casts. The happy effect of the preparations of tar in resolving chronic inflammations of the skin was considered, and a similar good effect on the bronchial mucous membrane was hoped for.

He continued the above treatment faithfully seven months, when, feeling, as he expressed it, "rawness and soreness in his lungs," he discontinued all treatment.

I saw him May 1, 1879. He states that he is, and has been during the fall and winter, in perfect health. He has gained ten pounds in weight, has lost his anæmic look, and has no cough.

The experience of some of our leading physicians in this disease will be seen from the following extracts from personal letters:—

Dr. T. G. Richardson, of New Orleans, writes, "in a practice extending over nearly one-third of a century, I have never encountered a case of plastic bronchitis."

Dr. W. H. Geddings, of Aiken, S. C., has "never met with a case."

Dr. F. Peyre Porcher, of Charleston, S. C., says, "in a hospital practice of fifteen years, with numerous post-mortems, I have never seen a single case," but he refers to one, the cast of which is in the Medical College Museum, and the history is reported in the *Transactions of the South Carolina State Medical Association*, 1874.

Dr. T. Grange Simons, of Charleston, refers to a case in his practice, "occurring in a negro child aged four years." When first seen by him, it had been ill for several days with the symptoms as of acute bronchial catarrh, and had expectorated several casts of the bronchia. It died within thirty-six hours. He notes the occurrence of two cases in the practice of Dr. J. M. F. Geddings, both of which were in adults, recurring periodically, and were dependent on bronchitis. He also notes a case as reported by Dr. T. T. Robertson, of Winsboro', S. C.

Dr. Jerome Cochrane, of Mobile, writes, "the disease is wholly unknown in this section of the country."

Dr. James H. Hutchinson, of Philadelphia, says, "during a long connection with the Pennsylvania and Episcopal Hospitals, I have only seen one well-marked case, and have never had a case under my care."

Dr. H. I. Bowditch, of Boston, writes: "I do not remember ever having recorded or treated a single case during my whole professional life, since 1835."

Dr. R. H. Fitz, of Harvard College, has "seen four specimens of casts during a period of nine years. The histories of these cases gave few and trivial symptoms; at the most a slight cough. Structurally, the casts were composed simply of cells and mucus, and I have therefore considered them to be the result of limited bronchitis, with retention and partial inspissation of secretions."

Dr. Theophilus Parvin, of Indianapolis, has "had no case" in his practice.

Dr. James T. Whittaker, of Cincinnati, O., has "had no personal experience with the disease."

Dr. Geo. P. Andrews, of Detroit, "I have never seen or heard of a case in my section."

Dr. Roberts Bartholow, of Cincinnati, O., writes: "I have seen one well-marked case in which a complete cast of the tubes on one side was expectorated down to at least the bronchioles. It came away almost entire. Microscopically, it consisted of a fine reticulation of fibres and mucous corpuscles. The case presented the ordinary signs and symptoms of capillary bronchitis, and terminated fatally by catarrhal pneumonia."

Dr. Jas. R. Leaming, of New York, has "seen two cases of plastic bronchitis, both in consultation. One of these died later of diphtheria."

Dr. Austin Flint, of New York, writes: "I have met with three cases of plastic bronchitis; one case occurred in a man in middle life, of intemperate habits, and was fatal. In a second case, I received quite an extensive cast, with the history, that the patient was a young woman, who had had repeated attacks, during which she had expectorated large quantities of similar casts. A third case was that of the late Dr. Stephen Rogers, reported in the *New York State Medical Association Transactions*, 1866, and which is now in the Museum of Bellevue Hospital."

Dr. Flint also notes a case of a patient with phthisis, in which casts of a portion of the bronchial tree were expectorated, after profuse and persistent hæmoptysis. Microscopic examination proved that these casts were formed by coagulation of the effused fibrine of the blood, and hence it was not a case of true plastic bronchitis. He also notes a case, "of a man who died of bron-

chial hemorrhage, in whom the bronchial tubes of the whole of one lung were occluded by discolored fibrine."

Dr. Gleitzman, of Ashville, records one case seen in a lady with early phthisis. She recovered.

Dr. J. M. Da Costa, of Philadelphia, writes: "I cannot recall the number of cases that I have seen in practice, but I have in my collection two fine specimens of casts of plastic bronchitis; one, very large and giving complete casts of bronchial tubes on both sides, occurred in a young girl, and it came away after an emetic: the case recovered. The second case was a man. In this case a large plug completely obstructed the left bronchial tube, and its expulsion was preceded by several hemorrhages."

Dr. Alfred Stillé, of Philadelphia, kindly sends me the full history of a case of which he has the cast, and which was reported to him by Dr. Wm. B. Lank, of Finlayville, Pa. "A. G., a blacksmith, æt. 25, of great physical power, began to suffer without any apparent cause, with shortness of breath, and a sense of constriction of the left side of the chest, and with irregular and violent action of the heart; there was no pain, cough, or fever. The dyspnœa was so severe at times as to threaten life. These symptoms continuing for two months, ascites and œdema of the legs occurred, the face was livid, the expression distressed, and lying down was impossible. A state of somnolency was almost continual. Besides the disorder of movement of the heart above mentioned, there was jugular pulsation. The left side of chest dull on percussion, right side abnormally resonant. In the left lung respiration was bronchial with sibilus; in the right, exaggerated.

"Dr. Lank took charge of the patient in the eleventh week of the attack, gave him egg-nog and iron, and applied a large blister to the left side of the chest. Within forty-eight hours, expectoration of a sero-albuminous liquid began, and moist râles were heard over the left lung; there was little or no cough. A second blister was applied on the fifth day, and, on the sixth, the patient was almost choked by coughing up a large quantity of casts of the bronchial tubes, 'white as pearl, lustrous as satin, and exhaling an extremely unpleasant odor.'

"The quantity of expectoration of this sort was nearly a quart from first to last. The casts had often to be extracted from the throat with the fingers. Directly after this expectoration breathing became free, the heart regular, and the jugular pulsation

ceased. For two months longer some casts continued to be expectorated, and, a few weeks later, the patient regained his former health."

Dr. Alison Maxwell, of Indianapolis, gives me the history of a case as reported by Dr. Thomas L. Murdock of that city.

"I was called Jan. 3, 1877, to see Florence Von C., a girl eight years of age, rather large, of light complexion, and scrofulous diathesis. She had been having violent but not frequent coughing spells, some dyspnœa, with very little expectoration and occasionally slight pain and soreness in the right side. Has also had 'light chills, followed by fever and sweating each alternate evening.' The appetite was good and she felt playful and well most of the time. This condition had existed about two months; she had been taking cough mixtures and quinine, but had not been under the care of any doctor. There was no hoarseness at any time. The larynx and trachea were healthy, and from previous history and present appearances, no trace of diphtheria or croup could be detected. Nothing abnormal could be found on percussion. The respiratory murmur could not be heard over a small, well-defined space in the region of terminal branches of bronchus leading to middle lobe. The case was thought to be one of circumscribed chronic catarrhal bronchitis, with some pneumonitis or collapse of air cells. The treatment consisted of chlorate and iodide of potassium, with chloroform and belladonna, to allay the violence of the cough, and wild cherry, cod-liver oil, and quinine for tonics; also, external applications of iodine and warm poultices. Previous to February 16th, some thick tenacious matter was expectorated, but nothing suggesting false membrane. On that day, while coughing, a dense, firm membrane about two inches in length, and one-fourth inch in diameter at the largest extremity, being a perfect cast and distinctly showing the bronchial subdivision, was coughed up. After the expulsion of this membrane, the cough and irritation almost instantly subsided with very little expectoration, and none that would be called purulent or bloody. In less than a week the lung action became normal, and no more trouble has been experienced to the present time, about two years. A microscopical examination made by Dr. Maxwell showed numerous pus corpuscles with a few red blood corpuscles."

Dr. Samuel G. Armor, of Brooklyn, says: "I have seen but few cases of the disease; I believe in all the cases, hemorrhage

either preceded or accompanied the membranous expectoration. They were all of the chronic form, and were preceded by catarrhal bronchitis. My general recollection is, that they all finally terminated in pulmonary phthisis."

Dr. Frank Donaldson, of Baltimore, states, that he has only seen one case of plastic bronchitis in this country, and this occurred in the Baltimore Almshouse and Hospital in 1853.

Dr. Henry Gibbons, Sr., of San Francisco, writes: "I have never seen a well-marked case of plastic bronchitis during a practice of fifty years."

Dr. Chas. Denison, of Denver, has never met with, or heard of a case in Colorado.

Dr. G. Baumgarten, of St. Louis, reports the following case in the January number of the *St. Louis Medical and Surgical Journal*, 1869.

"The case occurred several years ago, and it was in the practice of Dr. P. H. Weigel." The patient was "a robust man, in middle life, *potator*, of good constitution, and had been suffering from the affection for about six months. His chief symptom and cause of complaint was the frequent expectoration of the fibrinous bronchial casts in question, which was effected by violent exertions in a fit of the most intense dyspnœa, with livid face and perspiration; relief, however, immediately followed the discharge of the sputum, and there was no dyspnœa in the intervals. At the time Dr. W. first saw the patient, these seizures of cough and dyspnœa leading to the expulsion of a surprising mass of fibrine, were frequent, often occurring more than once in an hour; the number of specimens presented to me, more than a dozen larger or smaller arborescent masses (which completely filled an ordinary quinine bottle) are said to have been expelled in one day. The physical exploration of the chest gave negative results. Fever was absent and the general health suffered but little, the patient being about; after a time, emaciation took place, which was attributed however to a temporary withdrawal of the alcoholic stimulus and stricter diet. The disease improved slowly under various plans of treatment, the size of the casts and the frequency of the dyspnœic paroxysms diminished considerably; the patient finally left the city after many months of treatment, benefited, but not entirely relieved. According to later information the case must have lasted not much less than two years, but ultimately got well."

Dr. P. Gervais Robinson, of St. Louis, presented to the St. Louis Medical Society last summer a cast with the following history as reported by Dr. Edwards, of Brownsville, Mo.: "Oliver Scott, aged 30, formerly a farmer, at present keeping a restaurant. Mother died in 1868 of hæmoptysis; his only sister died at 15, disease unknown; his father is a stout, well-built man, and healthy. The patient has been troubled for twelve years with cough and spitting of blood. Sometimes the sputa would be streaked with blood, at others there would be quite severe hemorrhage. He had slight attacks of asthma prior to 1872, and for the past six years has had chills and fevers. Was called in consultation to see him for the first time on the night of November 9, 1877; found him bleeding very freely from both the lungs and the nares. The physician in attendance had been giving him large doses of acetate of lead and tannin, applying cold water to his head and neck, and giving him small pieces of ice to swallow at short intervals. Under this treatment he continued to get worse, until he became almost bloodless. Thinking that the cough was probably caused by the blood from his nose running down into his throat, I immediately applied plugs of lint soaked in liq. ferri persulph. to both anterior and posterior nares. This at once put a stop to the epistaxis, but the hæmoptysis continued and became more profuse. I then advised ten grains of gallic acid and half a drachm of fluid extract ergot every hour.

"In about fifteen minutes after taking the first dose, the bleeding was somewhat checked, and, when he raised his head to take the second dose, he was seized with a fit of coughing, and threw out a piece of fibrinous cast. The hemorrhage almost immediately ceased.

"The next morning he commenced spitting blood again, and in about an hour afterwards, he coughed up four other pieces, nearly as large as the first. He has had no hæmoptysis since, but the epistaxis continued to trouble him for some time, and I was called to re-insert the plugs on the nights of November 13th and 17th. During the whole time of his sickness (twelve years), the hemorrhage was always worse at night and seldom gave trouble during the daytime.

"The physical signs observed by me at my first visit were, diminished resonance and subcrepitant and sibilant râles in mammary region in front, and over the infra-scapular region behind;

at present, there is slight increase of resonance all over the chest; a slightly increased elevation of the ribs in breathing, and a slight diminution of chest expansion; he complains of a difficulty in breathing when he exerts himself; I think he probably has a commencing emphysema of the lungs; he tells me that he weighs now 18 lbs. more than he ever did, and feels that his health is getting better in every way."

Further notices and reports of cases will be found in the *St. Louis Medical Journal*, 1869, by Dr. Wilson; *Proceedings New York Pathological Society*, 1877, by Dr. Beverly Robinson; *Transactions New York State Medical Association*, 1866, by Dr. Stephen Rogers; *Transactions State Medical Association of South Carolina*, 1874, Dr. T. Grange Simons; *The Physician and Surgeon*, Ann Arbor, April, 1879, p. 169; as also in an article on Plastic Bronchitis in *Flint's Practice of Medicine*.

I have thus been able to note the occurrence of twenty-three cases as reported occurring in this country. Not a large number, truly, but considering the rarity of the disease as given by European writers, and considering the incomplete and unsatisfactory manner in which these statistics have been obtained, it gives us some idea of the rarity and of the symptoms of the disease. The unfortunate habit of many American physicians, of not recording their cases, makes the collection of statistics very unsatisfactory and unreliable. Probably many more cases have occurred besides those noticed, but as we have here the experience of leading physicians, living in different sections, and in centres of population, who would probably hear of or see such cases when occurring, we can consider those recorded as approximating the true number.

In European literature we find the subject thoroughly investigated by several writers.

The latest and most complete bibliography will be found in an article on Plastic Bronchitis, by Riegel, *Ziemssen's Handbook of the Diseases of the Respiratory Organs*, p. 165.

Biermer, in *Virchow's Handbuch der Pathologie und Therapie*, has collected fifty-eight cases, with a thorough investigation of the subject.

Lebert, in his book, *Klinik der Brustkrankheiten*, and in a monograph in the *Deutsches Archiv f. Klin. Medecin*, vol. vi., has still further extended the number.

Dr. T. B. Peacock, in the *Transactions of the London Pathologi-*

cal Society, and in the *Medical Times and Gazette*, 1854 (reprinted in the *American Journal of Medical Sciences*, 1855), notices thirty-four cases, some of them taken from German authorities.

A report of two cases, with a full account of the disease, will be found in Watson's Lectures, and the disease is considered in several of the text-books on general medicine.

The latest report on plastic bronchitis will be found in *Schmidt's Jahrbuch*, vol. 163, p. 28, 1874. Kretschy reports ten cases in addition to those collected by Biermer (1867), three of which are acute, and seven chronic. To which may be added four cases of Chevstok (*idem*, vol. 173, p. 136).

Plastic bronchitis, croupous bronchitis, or bronchial polypus, as it has been variously termed, is an inflammation of the bronchial mucous membrane, characterized by a fibrinous exudation. It may occur in the bronchi in connection with a similar exudation in the larynx and trachea; it may develop by continuity from croupous pneumonia, or it may occur primarily and be limited to the bronchi. Plastic bronchitis is the term properly given to this last class of cases, where the exudation occurs in the bronchi, without a similar condition existing either in the laryngo-trachea or in the alveolæ.

The number of cases recorded has been comparatively few. Biermer (1867), after a most exhaustive study of European records, could only find 58 cases, to which may be added 41 cases noticed by Peacock, which probably include many already reported by German authorities. Lebert has found 34 cases in which the histories are so imperfect as to render the exact nature of the disease doubtful. To these we may add the 10 cases reported by Kretschy (1874), and the 4 cases of Chevstok, making in all, in German reports, 72 reliable cases.

The disease occurs more frequently in males than in females. According to Biermer the ratio is 3:1; whilst Lebert gives it 3:2. Peacock also finds it more frequent in the male sex.

The earliest age at which it has been observed is four years (Simons, Charleston, S. C.), the oldest, seventy-two (Goumcœns). Wunderlich and Murdock have each reported cases of eight years, and Biermer one of five. Most frequently it is found between puberty and the fiftieth year; only four cases have been observed beyond the fiftieth year. It is said to occur most frequently in the late spring, about the time when pneumonia is most prevalent.

Menstruation and pregnancy have a seeming influence upon it. Schnitzler gives a case where the attacks coincided with menstruation, and mentions several occurring during pregnancy. But this may be a mere coincidence. Oppolzer mentions a case which came on monthly at the time of the catamenia, whenever this was absent. The etiology of the disease is very obscure. In the majority of cases, it seems to have arisen from exposure as in ordinary bronchitis. In a certain number of cases, the tubercular or scrofulous diathesis has been present, but in far the largest number, the persons attacked seemed to have been in previous good health.

Biermer is inclined to believe that tubercle and scrofula bear the same relation to the disease as will be found in any other debilitating influence, and states emphatically in contradiction to the views of Rollett, that there is no more connection between plastic bronchitis and phthisis, than between it and ordinary bronchitis. Hemorrhages, and the occurrence of effused fibrinous bronchial plugs in phthisical cases, as is shown in the two cases cited by Dr. Flint, may have caused the seeming connection between the two diseases.

The view of Stokes, that the lining membrane of the bronchi loses the mucous and partakes more of the serous character as it approaches the periphery of the lungs, is denied by Peacock, who "can only assume that the exudation depends on a specific character of inflammation resulting from some peculiarity of the individual."

The casts when ejected are of a pearly white color, unless discolored by blood; the larger portion hollow and filled with air and mucus; the smaller branches are solid and subdivide until forming fine threads. The cast is formed of a series of concentric layers of fibrin; it is nearly cylindrical, giving a mould of the bronchial tree and its ramifications, and is of considerable toughness and firmness. The tubes in which it is most generally found are those of the third and fourth size. The casts with shorter branches are said to come from the upper part of the lungs. Microscopically they consist essentially of fibrine, containing occasionally products of inflammation.

Plastic bronchitis occurs in an acute and in a chronic form; the acute type is very rare: Lebert has only been able to find seventeen cases reported. The duration of the disease in fatal cases, which comprises one-half of all (Biermer), is between three

and fourteen days. The disease commences as a rule with the symptoms of simple bronchial catarrh; after a few days a sense of heaviness over the chest is experienced, and a chill followed by high fever comes on; the cough becomes violent and occurs in repeated paroxysms, the fever increases, and the dyspnœa becomes intensified until the patient experiences a sense of intense suffocation. Portions of membrane mixed with catarrhal sputa are expectorated with great effort, until at last the cast is thrown off, when there is a comparative relief from all symptoms, at least for the time being. In fatal cases there is a continuation and constant aggravation of symptoms until at last the patient becomes somnolent, ceases to expectorate the casts, and, soon becoming unconscious, dies.

At times the disease simulates a pneumonia, with the usual chill, and pain in the side. The casts may even be wanting in the expectoration, and in one case mentioned by Biermer there was no cough, probably due to inability. Dyspnœa is a constant symptom, and the fever has been absent in only one case reported (Caspar). The physical signs present are greater or less suppression of the respiratory murmur over the affected bronchi. Subcrepitant and occasionally sibilant râles are heard when the cast has become loosened. M. Valleix mentions a peculiar clicking valvular sound, the "*petite bruit de soupape*," which has also been noticed by Cazeaux, Barth, Girondet, and Gordon, as being occasionally heard over the affected part.

Percussion sound is generally negative. A typical illustration of the acute form of the disease will be found in the case of Ruck (*The Physician and Surgeon*): "A woman fifty-seven years old, of previous good health, and healthy parents, suffered for two preceding years from occasional cough and shortness of breath upon exertion, constipated bowels and diminished appetite. Upon taking cold she had rather a severe chill followed by fever, a feeling of lassitude and weakness, thirst, increased cough and dyspnœa. The patient became weak very rapidly, the cough assuming a violent and paroxysmal form, with sense of great dyspnœa. A short time before death, during such paroxysms, which were accompanied by loud mucous râles, the patient expectorated three mucous balls, after each of which she experienced temporary relief.

"Professor Chevstok, now called in consultation, found the patient extremely weak and sinking rapidly, the voice, however,

not hoarse and the cough without croupous tone, the jugular veins moderately distended. The chest appeared moderately broad, long, slightly arched; respiration increased in frequency and motion of the left side diminished; the intercostal spaces contracting much less during inspiration than on the right side. Percussion showed normal lung sound. No respiratory sound over the whole of the left lung except toward the root, where bronchial breathing was heard; on the right side the respiration was exaggerated; the pulse was small and weak, 104. The sputa continued—mostly of mucus, and three moderately solid balls about one and a half to two centimetres in diameter, apparently of grayish-white mucus, and when disentangled presented the characteristic tree-like appearance of the bronchi. The patient continued to sink rapidly, did not vomit nor expectorate any more casts, became somnolent, unconscious, and died on the second day."

Also the following case of Kretschy, *Wiener. Med. Wochenschrift*, xxiii., 1873.

The patient was a young man who had had a hacking cough for three weeks, otherwise entirely well. Suddenly he had a chill followed in one and half hours by fever, with great dyspnoea and violent attacks of coughing. The next morning after a most intense feeling of suffocation, a reddish fleshy mass was ejected. His breathing became at once free, a slight hacking cough remained, with a slight increase in temperature, languor, and a pain in his head.

Three days afterwards he was examined by Prof. Duchek. His respiration was quiet, and he had slight catarrhal fever and slight cough. There was no dulness on percussion. On auscultation a few mucous râles were heard posteriorly over right lung. In the course of the morning a violent attack of suffocation and cough came suddenly on and continued until patient had expectorated a reddish mass, which, when spread in water, showed a complete cast of the bronchus; it was eleven centimetres long.

5th day. No fever in the morning; in the afternoon he had again a chill followed by fever, when another cast was expectorated with the previous symptoms.

9th, 10th, 11th days. High fever with intense dyspnoea, moist râles numerous over right lung: after an emetic, two casts were expectorated. Died on 16th day.

At the autopsy, the trachea and bronchi were found injected

and filled with mucus. A fibrinous cast occupied the middle and lower portion of the right bronchus. The left lower lobe, as also the portion of upper lobe contiguous to it, as well as the posterior part of the right lung, were empty of air and infiltrated with bloody serum. The lower bronchial tubes of the right lung were partly filled with a yellow fluid and partly with fibrinous mucus.

In the chronic form of the disease there are no constant and definite symptoms. It may present, in the beginning, symptoms similar to those found in the acute form; these, however, subside after the ejection of the cast; a periodic expectoration of bits of casts, together with occasional spells of dyspnoea, may be afterwards the only apparent symptoms. As a rule, however, the chronic form commences with the ordinary symptoms of a mild bronchitis, which is sooner or later accompanied by the expectoration of fibrinous pieces. The general health of the patient is little changed; there is usually no fever; dyspnoea is occasionally apparent, previous to the expectoration of the casts, which occurs at greater or less intervals. This condition may continue for years. Walshe observed a case in which the disease continued with intermissions for fourteen years. Nichols reports in his case that pieces of casts were expectorated daily for seven years, after which the patient recovered.

Hemorrhage occurred in about a third of the cases noted. (Biermer.) At times it precedes the expectoration of casts, at times accompanies it; it may be slight, and again in other cases it may be very profuse.

The diagnosis of plastic bronchitis rests entirely on the presence of casts in the expectoration; a discrimination between this and laryngeal croup will be easy, from the presence or absence of laryngeal symptoms. The only cases which may give room for doubt are those of croupous pneumonia, in which small particles of fibrinous pieces are ejected; and cases of bronchial hemorrhage in which moulds of the tubes are formed from the fibrine of the effused blood.

Biermer gives the differential diagnosis between these two conditions as follows: the moulds of the different ramifications are never so perfect in the fibrinous plugs as in the plastic casts; in color they are not so pearly white, and are less homogeneous; they are different in form and structure, the casts being formed of laminated concentric layers. In the plugs the blood is inti-

mately mixed with the fibrine, whilst in the casts it is superficial and may be wiped off. The prognosis of chronic plastic bronchitis is generally favorable. In persons of a tubercular diathesis it may be the provoking cause of the disease. The records show that few of the whole number of cases have developed into pulmonary phthisis. Emphysema is a much more common sequence.

Oppolzer relates a fatal case where the patient died from a lodgment of a large cast in the glottis.

In the treatment of plastic bronchitis attention must be given to two points: to promote the expectoration of the membrane, and to prevent its recurrence. To accomplish the first, inhalations of lime-water (Wunderlich) bicarbonate of soda and lactic acid are indicated. When the casts are loosening, an emetic, or the hypodermic injection of apomorphia, has given good results. (Riegel.)

The remedy that has been most generally recommended is the iodide of potassium (Wunderlich, Thierfelder, Sklarek). It is claimed to have the property of loosening and disintegrating the exudation.

The mercurials are strongly advised by Biermer, Peacock, Thierfelder, and other writers. Counter-irritation is recommended; a blister certainly accomplished good results in the case reported by Prof. Stillé. To prevent the re-formation of the exudation, remedies that seem to have an influence on the mucous membrane should be used; theoretically cubebs and the balsams are indicated; iodide of potassium and muriate of ammonia have been highly recommended. In my own case, I believe, the good results attained were due to the inhalation of tar and carbolic acid; the softened condition of the latter casts, and especially the disintegration of the finer filaments, would seem to prove this. The strength of the patient should be built up with tonics, and when phthisis is threatening, cod-liver oil and arsenic are indicated. The removal of the patient to the pure air of the country from the dust and smoke-laden atmosphere of towns will be a prime necessity, and the rules of hygiene in relation to climate, habitation and clothing must be strictly applied.

INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

By JOHN V. SHOEMAKER, A.M., M.D.,

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AN affection involving the hair-follicles of the beard has been described by both ancient and modern writers under the name of sycosis. It is a non-contagious disease, and is said by some to not only attack the beard, but also the scalp, the eyelids, the axilla, and the pubic regions. It is evident, however, from the description of the disease given by many, that its usual location is in the beard. In my own experience the affection has always commenced in it, and has occasionally spread to other hairy parts of the body. Having lately had under my care several well-marked cases, I propose to describe the affection briefly, and also the manner in which these patients were successfully treated.

The development of inflammation of the hair-follicles of the beard is usually preceded by a sense of heat, tension, or itching upon some part of the face. This is followed by the appearance of small solid elevations which are pierced in the centre by hairs. These pimples rapidly pustulate, break spontaneously, and force out an exudation, which dries into slightly adherent crusts. The hairs are firmly seated in the follicles, and are neither brittle nor tecturally altered, but, when removed by extraction, or when loosened and cast off by suppurative action, their roots are found to be enlarged and surrounded with pus.

The affection may attack the upper lip and the nostrils, or the sides of the face, or the chin; frequently it invades all parts of the face simultaneously. When the inflammation is confined to the upper lip, it sometimes passes up within the nostrils and affects the follicles of the stiff hairs, or vibrisæ. Cases of this description become excessively obstinate, and at times extend to

the Schneiderian membrane. The columna that divides the nostrils becomes swollen and inflamed. In addition, the nose becomes hot and exceedingly painful, and upon the slightest movement the tears pour from the eyes.

The character of the disease varies considerably, according as the eruption is isolated or in patches. In some cases the papules and pustules are distinct, few in number, and are succeeded by scabs which quickly dry and fall off. In others, there is a succession of papules and pustules until they extend over the whole surface of the face. The papules and pustules coalesce, and the inflammation penetrates deeply to the derma and the subcutaneous cellular tissue, producing tubercular elevations which successively suppurate, so that there are formed numerous abscesses which obscure the primary affection. When the disease has reached this stage, the skin being covered with unhealthy granulations and abscesses, with many openings which pour out pus that rapidly dries into crusts, the whole surface is extremely tender and painful. If now the inflammation is allowed to progress without proper interference, crusts and hairs will be cast off by the ulcerative action, and the tissues of the part here and there will undergo atrophy, causing permanent scars and loss of hair.

Inflammation of the hair-follicles of the beard will likewise be modified very much, according to the condition of the hair. If the hair is feeble in growth, and is short and thin, or should it be cut close or shaved, the disease is more distinctly seen and more easily managed. If, on the other hand, it is vigorous in growth, and is long and thick, the diseased surface can only be seen by separating the hairs; and the affection will be very hard to control until the hair is cut close to the part. When the hair is in this latter condition of especial luxuriant growth, it often becomes matted together with pustules, tubercles, crusts, and scales, giving to the countenance a disgusting appearance.

Inflammation of the hair-follicles of the beard is a non-parasitic affection, and is usually due to constitutional causes. It may be excited by local irritants, as want of cleanliness, etc., or it may depend directly upon a debilitated system. It often occurs in those who are mentally or physically overworked. It follows from the use of unwholesome food, excesses of all kinds, and in convalescence from exhausting diseases. It is excited in those who are out of health, and engaged in certain occupations

where they are subjected to high and low temperature, as in glassblowers, blacksmiths, founders, male cooks, bakers, and ice cutters.

Inflammation of the hair-follicles of the beard is most easily mistaken for *tinea barbæ*, or barber's itch, but no difficulty should occur in making the diagnosis, after comparing the characteristics of these affections. In the former, the disease is limited to hairy portions of the face; it is non-parasitic, the papules, tubercles and pustules, are pierced in the centre by hairs. The hairs are in their normal or natural condition, and are firmly seated in the follicles, except when removed by supuration or extraction, when the roots are found to be enlarged and covered with pus. On the other hand, barber's itch is a parasitic affection, and is usually ushered in by small red or scurfy patches. The hairs become loosened in the follicles, brittle, altered in texture, and as the disease advances are mowed down in large numbers, leaving nothing but stubbles over the surface. If the disease is masked by tubercles, pustules, pus, scabs, and matted hairs, the only way to make out a true diagnosis is to suspend your judgment until the crusts and hairs can be examined by the microscope. It is sometimes exceedingly difficult to distinguish between inflammation of the hair-follicles of the beard and eczema, when the former has passed beyond the primary condition and the parts are covered with pustules, crusts, and scales. All doubt, however, can be set at rest by bearing in mind that eczema is usually preceded by the formation of vesicles, which burst, giving rise to a catarrhal discharge. Again, inflammation of the hair-follicles of the beard is generally confined to the hairy portions of the face, while eczema usually extends to the surrounding parts. Syphilitic or scrofuletic pustules and tubercles, developed on the hairy parts of the face, might be confounded with inflammation of the hair-follicles of the beard. It will be found, however, that syphilitic or scrofulous lesions will usually be preceded by a history, and the existence of pustules and tubercles will be evident upon some other part of the body. Again, in specific affections, if crusts should be present, and should be removed, a well-marked ulcer, having sharpened edges, will be observed. On the contrary, in inflammation of the hair-follicles of the beard, if crusts are removed, there is little or no loss of superficial substance. Pustular acne, likewise, at times presents appearances similar to the early stages

of inflammation of the hair-follicles of the beard; but there are points of distinction which can always be relied upon for diagnosis. In acne, the pustules are generally isolated; they are present in both sexes, and are not confined to any one region of the body, while in inflammation of the hair-follicles of the beard the pustules are usually aggregated together in patches, are pierced with hairs, and are limited to the male, in whom the beard has grown.

Inflammation of the hair-follicles of the beard is one of the most intractable diseases of the skin, and, if neglected, the hairs soon fall out or are cast off, and the part becomes covered over with small scars, causing great deformity to the face. In order, therefore, to illustrate some of the typical forms of this affection and the means which I have found most satisfactory in its treatment, I shall briefly enumerate several cases out of a number that have come under my observation.

CASE I. Wm. R., aged 24, a glassblower by occupation, came to my clinic at the Free Dispensary for Skin Diseases at Philadelphia, September, 1878, for the relief of a pustular eruption of the upper lip. The whole surface of the lip was covered with a well-formed mustache, the hairs being unusually long, and well developed. By separating the hairs, I could see that the lip was tumefied and covered with small papules and pustules, with hairs running through all of them. The columna separating the nostrils was inflamed, and the nose was much enlarged. The patient was placed in a chair, facing the light, the head being thrown back, and by gentle pressure on the tip of the nose, I was enabled to get a good view within each nostril. A number of pustules could be distinctly seen pierced by the short, thick hairs just within the nostrils. All the mucous membrane within looked angry and inflamed, especially the part covering the cartilage of the septum. Lachrymation was excited the moment I made the least pressure upon the inferior part of the nose, or moved the surrounding hairs. The affection, he stated, began eighteen months before by a prickling and itching feeling of the upper lip and side of the nose. The next morning two little pimples appeared, and in a few days' time these turned to mattery heads. The disease had progressed ever since, becoming worse, notwithstanding all the medical care and attention he had received. Beyond the patient being pale, and having a

careworn and anxious expression, and loss of appetite, I was not able to detect any other diseased condition. I learned, however, that for the past two years he had been frequently off on drunken sprees. In answer to my inquiry as to what had previously been done for his trouble I was informed that Donovan's solution had been used internally, and locally salves, lotions, and poultices, and that for one month he had faithfully tried shaving, but found that it was very painful, and increased the disease more and more after each attempt.

Taking into consideration his debility, I concluded that my patient needed a building-up treatment instead of alteratives. I commenced by cleaning out the alimentary canal with saline aperients in order that the liver and kidneys might be better able to eliminate the effete products. At the same time dilute nitric acid, from ten to thirty drops with bark, was given three times daily, followed by small doses of iron and quinine. All stimulants were strictly forbidden and the plainest and most substantial form of diet was ordered.

While correcting the general health of my patient, I began the local treatment by enjoining perfect rest of the part. The patient through the kindness of his employer was changed from blowing glass to another part of the business, that of pressing glass stoppers.

My next step locally was to cut the mustache quite close with a pair of curved scissors, and to vigorously deplete the parts with incisions all over the diseased surface. The depleting operation was performed with a small, delicate curved bistoury, pointed upon the extremity and cutting upon both sides. I quickly inserted the point of this knife into each lesion, cut freely through the papules and pustules, and at the same time I punctured thoroughly the inflamed parts within the nose. This operation was succeeded by the application of warm water, and the parts were allowed to bleed freely, after which the surface was covered with a starch poultice which was allowed to remain from one to two hours. Immediately after removing the poultice, a bland, oily preparation, composed of olive oil three ounces, and one ounce of oleate of mercury, was pencilled with a camel's-hair brush over the lip and up within the nose. The operation I have just described was repeated in the same manner twice a week, followed by the most efficacious result, as the disease disappeared with astonishing rapidity.

CASE II. Robert S., a blacksmith, aged forty-nine years, applied to the Dispensary for treatment, November, 1878. His chin and neck were covered with groups of papules and pustules, pierced with hairs, and accompanied with marked redness of the surrounding skin. The hair on the chin and neck had been kept short by shaving. The sides of the face were also closely shaven, while the upper lip was well supplied with long and thick hairs, but neither of these latter regions was involved. About three weeks previous to calling at the Dispensary, the patient remembered having a smarting sensation on the chin and neck, and this was succeeded by a hot, burning feeling, and the appearance of this eruption. He was certain beyond a doubt that his trouble had not followed shaving, but complained that the latter always aggravated the disease. He was large and well developed, and was to all appearances in good health, but upon a careful examination I detected evidence of marked nervous depression by the tremulous condition of the tongue, the irritable state of the heart, and the coldness of the extremities. His habits were good and he had always been well until lately when great prostration was experienced from family afflictions. The general treatment in this case was conducted upon ordinary principles. He was warned particularly to avoid all mental strain, and live in the open air and take plenty of exercise. At the same time his system was toned up with iron, quinine, and hydrobromic acid. Locally, all the papules and pustules were punctured, allowed to bleed as much as possible, and the surface was then painted over with a combination composed of equal parts of olive oil and the oleate of bismuth. The papules and pustules gradually disappeared under this treatment, and by January of the present year my patient had entirely recovered.

CASE III. On Monday, January 3, 1878, A. L., forty-three years of age, a lawyer, came from a neighboring State to consult me for what he called tetter of the face. It was seen on inspection that the sides of the face, the upper lip and the chin, were covered with short, shaggy hair, and the entire area of this beard was the seat of a severe inflammation. The parts were overspread with papules, pustules, and large tubercles which were traversed with hairs. A large number of abscesses were present in the neck, cheeks, and nose, varying in size from a split pea to a walnut. Here and there among the abscesses could

be seen openings pouring out pus that quickly dried into incrustations and matted the hairs together. With the latter exception the hairs projected naturally from the follicles over the greater portion of the face, except in some few patches where they had been cast off owing to the marked suppurative action of the part. It was only by separating the hair that I could observe the true diseased condition of the skin beneath. The patient complained of a constant burning, throbbing, and painful sensation of the part that was so intense sometimes as to be hardly endurable. All this abundant eruption and the violent inflammation had actually caused the tissues to pass into a boggy and tumefied condition, giving to the countenance a hideous deformity. The patient informed me that about three months before he had noticed a prickling sensation on the right side of the face, just as if the hairs of the beard were being pulled. In about twenty-four or forty-eight hours little pimples were observed in the same location. These gradually cropped out until the time when first seen by me. The physician having him under care had treated the affection only by applications of salves and shaving, which had been continued for almost six weeks. During each attempt to shave, the face and pimples were cut and the hairs pulled upon, causing intense pain. Each repetition of the shaving made the disease worse. He further stated that for some time previous to this attack he would become easily fatigued after performing his duties, and that this condition had continued until his daily work could only be gone through with the greatest difficulty. At times he would be seized with an unpleasant or heavy feeling, either over the top of the head or the nape of the neck. His appetite had been variable, and occasionally his stomach had rebelled against food. In fact all these symptoms were only a chain of nervous phenomena, showing the irritated state of the nerve centres, and the lowered condition of the general system. It was therefore apparent that the disease had followed directly as a result of the weakened and prostrated state of the system from overwork.

My plan of treatment in this patient consisted in the use of both general and local remedies. The bowels and all the eliminating organs being sluggish, I began the internal treatment with a brisk mercurial purge, and followed it with saline aperients from time to time. The pus element predominating largely in the system, I endeavored by the following combination to

counteract it, and at the same time to assist in building up the constitution: Tincture of gentian compound and syrup of the lactate of iron, each two ounces; chlorate of potassium four drachms: two teaspoonfuls of this preparation were given one hour after meals, together with small doses of quinine before. I was soon rewarded by this treatment in seeing an improvement in the general tone of his system. Locally, I first cut the hair as short as possible, and afterwards removed the crusts and scales by means of oil dressing and starch poultice. This was immediately followed by an elegant emollient and soothing application consisting of two ounces each of olive oil and oleate of mercury, scented with oil of roses. The whole diseased surface was pencilled over with this preparation frequently during the day. After responding properly to the tonic treatment he was etherized and the parts were thoroughly depleted by passing the curved bistoury through the base of all the tubercles, pustules, and unhealthy granulations. The parts were then permitted to bleed freely by warm applications, the surface mopped dry and the oily preparation applied, giving the patient decided relief from the pain and burning sensation. This operation was employed twice every week with marked benefit. As the patient needed rest and quietness, together with a change of air, I sent him to the seashore and had him return twice a week for the operation. All the incisions made by my knife healed kindly, his general health rapidly improved, and I discharged him cured without a scar or deformity to the face the second week of April of the present year.

In concluding this paper I desire to add a few words as to the probable cause of this affection and the most efficacious method of treating it. In the first place, while I do not profess to define the cause, still I do know that in the course of my observation it has always occurred in those who are overworked, debilitated, anæmic, dyspeptic, during morbid blood states and nervous affections. Secondly. I hold that inflammation of the hair follicles of the beard will be protracted an unusual length of time by being treated only by external applications, and that under such circumstances it is by the recuperative action of the system that recovery takes place. If, however, cases be tested by both methods, side by side, it will be found that those receiving both the internal and external remedial agents will disappear with astonishing rapidity, while those having only local

applications will drag slowly on an indefinite period. I have found further in the course of my observation in this affection that depletion is essential and all-important. It relieves the enlarged and congested condition of the bloodvessels, allows the stagnated blood to circulate, the effused serum to escape, and prevents the formation of pus. On the contrary, my experience has been that shaving, the extraction of the hairs, and friction with green soap serve to increase the irritation, and at the same time, the use of ointments will do more harm than good by matting together the hairs and obscuring the diseased condition. In addition, I know from actual experience that the oils are the most efficient and successful local applications in this affection. They are more easily applied, are not so liable to become rancid, and will not mat together the hairs. I wish to repeat in closing that I have had the best results locally in this disease by the combination of olive oil and the oleates. Prominent among these latter preparations is the oleate of mercury, which, when used with an equal quantity of olive oil and scented with oil of roses, makes both an elegant and an efficient application. By using this preparation one can have the emollient action of the olive oil, the alterative effects of the mercury, and the astringent action of the oleic acid. The oleate of bismuth with olive oil is also a very valuable remedy in the milder cases of this disease, where we wish to obtain the soothing action of the bismuth and the emollient and astringent effect of the olive oil and oleic acid.

VERATRUM VIRIDE — GREEN OR AMERICAN HELLEBORE — ITS PHYSIOLOGICAL AND THERAPEUTIC EFFECTS CONSIDERED.

By G. F. COOPER, M.D.,

GEORGIA.

NOTWITHSTANDING this medicine has been known to the profession three-quarters of a century, its virtues as a remedy are imperfectly understood, and no little prejudice and ignorance still obtain concerning its use.

To present what the writer believes to be a truer account of the value of this agent as a remedy, founded upon an observation of nearly thirty years, and to notice some of the objections which are urged against it, and strip it of some of its terrors, is the object of this paper.

That it is a medicine of no ordinary power and certainty, none who have used it can deny, but we do not believe the dangers which some ascribe to it are at all equal to its powers; and, though its effects are sometimes apparently alarming, we cannot persuade ourselves, after long and extensive observation, that we are authorized to discard it.

As its botanical history may be obtained from various sources, it need not be given here. We propose to treat mainly of its physiological and therapeutical effects, and ask a patient and unbiased hearing, and a faithful and judicious trial of the medicine.

PHYSIOLOGICAL EFFECTS.

While its physiological effects are very marked, we have never observed the vertigo, headache, delirium, dimness of vision, nor dilatation of the pupils, which by some have been ascribed to the medicine when given in excessive doses, nor have we noticed coma, and, though there may be much relaxation, we have never seen diarrhœa.

In some experiments recently made in my own person, ten drops were taken, from a square one-ounce prescription phial, of what is known as Norwood's tincture, which in thirty to forty minutes produced a species of intoxication, not unlike that experienced while under the influence of Indian hemp, with slight tinnitus aurium and a faint tingling. In about an hour and ten minutes, there was slight nausea but no vomiting, and the pulse fell from 69 or 70 to 58 per minute.

Two days after, a dose of thirteen drops from the same phial was taken, the pulse being 70, respiration 18 to 20, temperature 101° . In half an hour there were increased flow of saliva, and a slight gnawing, mixed with a burning sensation in the epigastrium, the feeling somewhat like heart-burn, stomach somewhat qualmy; in forty-five minutes, slight sense of lightness in the head, tinnitus aurium, and faint tingling. In fifty-five minutes pulse 65. In an hour and fifteen minutes temperature $100\frac{1}{4}^{\circ}$, pulse 60, respiration 14. In two hours and ten minutes from the time of the first dose, five drops more were taken, when pulse was 56 and temperature $99\frac{1}{4}^{\circ}$.

A woman of intelligence, a member of the family, aged 38, took twelve drops from the same phial at 7 A. M. Temperature $99\frac{3}{4}^{\circ}$, pulse 72, respiration 21. In thirty-five minutes faint tingling, tinnitus aurium, and a feeling of lightness in the head, and slight burning in the stomach. In fifty minutes temperature 99° . In one hour and eight minutes pulse 60, temperature 99° , and tingling more perceptible. At this time took eight drops more. In fifty-six minutes after, pulse fell to 56. In one hour after the second, took third dose of eleven drops. In thirty minutes pulse fell to 52; some nausea. In thirty-eight minutes vomited, pulse 48. Sensation of a lump in the throat very marked, and somewhat distressing. In one hour and twenty minutes pulse 46, vomiting continued, but at longer intervals; perspiration quite marked, matter vomited viscid, mucus mixed with a green liquid; lump in the throat apparently moving up and down, always most distressing just before vomiting. After the last vomiting, which was an hour and ten minutes after it began, the feeling of a lump in the throat suddenly disappeared, with all trace of nausea.

To a full-grown hen three drops were thrown under the skin, temperature being $108\frac{1}{2}^{\circ}$ under the wing, action of the heart countless. In three minutes effects perceptible, panted rapidly,

but very quiet otherwise; pupils slightly contracted; temperature $107\frac{1}{4}^{\circ}$. In fifteen minutes heart's action 150, respiration 54, temperature $105\frac{1}{4}^{\circ}$. In thirty minutes heart's action 135 to 140, temperature 105° ; bowels had twice moved; respiration 30 per minute; could not stand erect. In forty-five minutes temperature $104\frac{3}{4}^{\circ}$, respiration only 15 per minute, eyes closed, head drooped; bowels acted third time. One hour, temperature $103\frac{3}{4}^{\circ}$, respiration 8 to 10 per minute. In an hour and fifteen minutes temperature had fallen to $101\frac{3}{4}^{\circ}$. It is worthy of note that the temperature in this case fell 7° lacking $\frac{1}{4}^{\circ}$, the heart's action was materially reduced, and the respiration showed the wonderful reduction from 54 to 8 per minute.

In the length of time it takes veratrum when given by the mouth to produce nausea and vomiting it is peculiar, being uniformly in adults never less than an hour. Long observation has taught us to look for it in one hour and ten to fifteen minutes. It is acknowledged that the vomiting is sometimes severe, but rarely prolonged to more than one hour, generally less when alcoholic stimulants are given in connection with tincture opii, in doses of eight or ten drops. We remember but one case in which the nausea and vomiting continued in spite of the stimuli. This was a child of less than a year old suffering with an obstinate and severe attack of bronchitis which had resisted the ordinary remedies in connection with small doses of veratrum. It was determined to increase the dose of veratrum, which in due time produced nausea and vomiting, which as before stated proved to be severe and protracted; but these finally ceasing the child was left in a state of great quiet, with its circulation and temperature much reduced. Continuing the veratrum in smaller doses the attack was from this hour broken and convalescence fairly set in.

We do not agree with Dr. Fordyce Barker who says: "In a small percentage of cases veratrum is quite liable to cause nausea, but this is readily counteracted by giving it in combination with the tincture of ginger." We would say, that, in the majority of cases where sufficient doses are given to reduce notably the circulation, nausea will ensue, nor do we believe that nausea will be readily counteracted by giving it "in connection with the tincture of ginger," because its power to produce nausea does not depend upon contact with the mucous coat of the stomach, but when thrown under the skin nausea is as certainly the

result; but we desire to commend the remark of Dr. Barker that "the use of veratrum viride is not incompatible with stimulants," and give him credit for the observation which we had overlooked.

In his work on Puerperal Diseases, p. 297, the following occurs: "My experience has abundantly demonstrated the truth of this apparent paradox. In one case veratrum viride did not seem to produce any effect on the pulse, which remained constantly above 130, until the condition of the patient was such that I decided to give brandy. After the first ounce had been given the pulse fell to 108; after the second to 86. Continuing the brandy, the veratrum viride was suspended for a few hours, and the pulse again rose to 130. After this it was curious to note the fact that, if the use of either agent were suspended, the pulse would rapidly increase in frequency, while, under the combined influence of the two, it was kept below 80 per minute. Another of my patients who recovered took one ounce of brandy and from three to *ten* drops of the tincture of veratrum viride every hour for two days, the quantity of veratrum viride being regulated by the frequency of the pulse, which was never allowed to rise above 80 per minute, although it sometimes fell to 40."

Sometimes pain and a burning sensation are complained of in the epigastrium, oftener the lump in the throat is present, and nearly always associated with the vomiting, coming and going with it. Hiccough is occasionally present but rarely continues long though the use of the medicine be continued. It is often true that the most satisfactory results are obtained without vomiting, or even nausea, which fact would suggest the idea that there is a property in the medicine possessing the power of reducing the circulation and calming the system without producing nausea.

In its power to slow the action of the heart and arteries it is unequalled, and in these respects is as invariable and certain as the action of any medicine known in the whole range of the materia medica. It retards the stroke as well as reduces the frequency of the pulse. We have often observed a pulse of 120 reduced to 70, 60, 50, and as low as 40 in thirty or forty minutes from the time the reduction begins; nor is the reduction in force at all commensurate with the reduction in frequency; while there may be some moderation in force, it would seem that much of the power of the medicine is expended rather upon the fre-

quency of the pulse. It is often true that a somewhat feeble pulse is increased in volume as its frequency is reduced. No one who has extensively used this medicine can have failed to observe this effect.

In cases where the vital energies have passed the point of recuperation, we could not reasonably look for this result to follow the use of the medicine. Some remarkable statements bearing upon this point are to be found in an article entitled "Veratrum an Antidote to Opium," by J. S. Todd, M.D., *Atlanta Medical and Surgical Journal*, February, 1876, p. 663. "In the case of a child six weeks old which had taken five drops of a tincture of opium which had remained unstopped until of a syrupy consistence, the breathing at 6 P. M. was 12, and sighing; pulse 60; coma well marked. Gave hypodermically one drop of veratrum viride in ten of brandy. One hour afterward repeated the dose; in fifteen minutes it vomited slightly—about half an ounce of mucus. At 9½ injected one-half drop of veratrum and fifteen of whiskey. At 10¼ child vomited freely, copiously, with instant improvement in every symptom. At 10½ respiration 24, pulse 100, pupils normal."

In a case of meningitis, æt. 12, morphine was given. "In fifteen minutes the symptoms were characteristic of opium-poisoning; contracted pupils, *no pulse*, stertorous breathing, and coma. Under the cold douche, and three injections, of three drops each, of tincture of veratrum viride, he promptly vomited; *pulse returned*, and pupils dilated in from one and a half to two hours."

We desire to call special attention to the states of the pulse in the above-mentioned cases.

If not invariably, certainly in many instances, both when the circulation begins to be impressed, and as the effect begins to subside, irregularity is to be observed in the pulse, which disappears when the effect is decided, or has abated, and this condition may be regarded as a sure index to the coming or waning effect of the medicine.

The duration of the influence of the medicine depends somewhat upon the condition of the system, for not only to this, but to many other medicines there is a resistance offered when febrile reaction is present, requiring not only larger doses, but shorter intervals. Whenever it is found that the doses may be

lessened, and the intervals prolonged, we may be assured of the final abatement of the fever, and improvement of the patient.

Respiration, while always affected by veratrum, is not always lessened in frequency *pari passu* with the circulation, but it can safely be claimed that it is generally reduced, and is a result for which we ordinarily look. It may be, as remarked by Dr. Wood, that the circulation and respiration are affected by different principles of the medicine.

Perspiration is a decided phenomenon, sometimes excessive where the full effects of the medicine are experienced. The surface of the entire body becomes cool, in part from the force of evaporation, and in part from the power of the medicine to reduce the heat of the body.

Dr. Stillé, in *The National Dispensatory*, p. 1484, in treating of veratrum viride, says: "It is remarkable that diarrhœa so rarely is present as an effect of excessive doses of this medicine; and that, notwithstanding the sedation of the heart, and the general appearance of collapse produced by them, no case of fatal poisoning of an adult by green hellebore should have been recorded."

Such a remark as the above could have been made only by one inexperienced in the use of veratrum viride.

We have seen in many instances the vomiting quite severe, pulse reduced to 60, 50, or 40, skin cool, with profuse perspiration—the condition which we suppose the writer would call collapse—and yet we have seen no case of "fatal poisoning," and our alarm has long since ceased, together with all apprehension of danger.

In the case of a girl, ten years of age, with pneumonia, to whom was given, through mistake for paregoric, ʒj of the tincture of veratrum viride, the effects were but little more severe than have been witnessed from the usual doses, and passed away in the ordinary length of time.

In another case, published in the *Atlanta Journal of Medicine*, if we forget not, a half ounce of the tincture was taken, with no disastrous result.

In the paper of Dr. Todd already referred to, the statement is made, that in less than six hours a drachm of tincture of veratrum viride was given hypodermically, and no serious effects were charged to it, and it will be seen that, in the case of puerperal convulsions reported in the *St. Louis Medical and Surgical*

Journal, to which reference will be made, within one hour sixty drops of Norwood's tincture of veratrum viride were given. We find our views on this subject fully in accord with those of Dr. Fordyce Barker, in his work on Puerperal Diseases, already alluded to, p. 493.

These facts, while they do not show that veratrum cannot produce death, do indicate most clearly that we need not fear doses which are sufficient to reduce the circulation, and cause all desirable therapeutic effects.

THERAPEUTIC EFFECTS.

Prof. Stillé says again that "veratrum is chiefly used by those physicians who disregard the interdependence of morbid phenomena, forget that the suppression of a symptom is not the cure of a disease, and overlook the consideration that, while the exhibition of fever may be prevented, the cause of fever may be destroying life."

This cannot but be regarded as a severe charge made by one who manifestly knows but little of the effects of the medicine from personal observation, and is not warranted by what follows: "The greater number of reports," he further says, "which have been published concerning the medical uses of green hellebore are unfortunately, not only deficient in the details upon which judgment could securely rest, but exhibit great ignorance of the natural history of disease, and of the relations of medicine to its cure."

If the reports upon which the author seems mainly to have relied have been so deficient in the details on which judgment could securely rest, we do not see how such sweeping condemnation of its use could be so unqualifiedly affirmed. No medicine of such powers as veratrum viride would be likely to escape indiscreet use and undue praise of its friends, nor the suspicious avoidance and hasty reproach of its foes. We need not therefore be surprised to learn that some have advocated the substitution of the lancet by veratrum viride. From the well-known effects of this medicine, this, in not a few instances, may be properly and wisely done, but no one who fully appreciates the invaluable effects of the lancet under some circumstances, would contend that its use should be wholly abandoned.

In his work on Puerperal Diseases, p. 296, Dr. Fordyce Barker observes: "Formerly venesection was regarded as the chief agent

for reducing vascular excitement, and there is no doubt that in some cases this measure was tolerated, and proved of great service; but, as we have seen, this disease—puerperal phlebitis—rapidly tends to depress the vital forces, and everything which accelerates such a result should be avoided. We have, however, two agents in our materia medica which act specifically as vascular sedatives. These are aconite and veratrum viride; simply as a vascular sedative, I greatly prefer veratrum viride, . . . and I think this is the fact with all who have had any considerable experience in the use of both; but I must tell you that this class probably constitutes but a small minority in the profession.”

The practice of to-day, compared with that of from thirty to fifty years ago, establishes, beyond controversy, that the lancet was indiscriminately used, and, in multitudes of instances, to hurtful and ruinous extent; still the lancet has a place in our armamentarium, and conditions do sometimes arise in disease, the removal of which can only be effected by bloodletting.

Free, oftentimes abundant, perspiration is one of the physiological effects of veratrum, and as the skin is justly regarded as one of the principal emunctories by which poisonous or hurtful elements in the circulation may be eliminated; and, as copious salivation and expectoration of viscid mucus from the air-passages are not unfrequently provoked by this medicine, it will not be denied that these also materially aid in the removal of noxious qualities of the blood; so that it cannot be truthfully charged, as has been done by Dr. Stillé, that this medicine “tends to retain in the blood all that is injurious in it;” nor can it be said that it “reduces the patient to such wretchedness that he is unable to take food.” While nausea and vomiting continue this is true; but in many cases, when these subside, a repose quite equal to that which follows the use of an anodyne is present, and not unfrequently marks the beginning of permanent convalescence.

In a case of typhoid fever which had continued twenty-eight or thirty days, and in which alarming hemorrhage from the bowels had occurred, and the most distressing jactitation we have ever witnessed, the jactitation, after resisting all efforts with opiates, valerian, musk, etc., was perfectly quieted by veratrum.

It is not safe to predicate virtues of medicines which have fol-

lowed in only a single instance, but the important point to be noted in this case is the fact that the patient was not only quieted, but his extreme condition in no wise made worse by the use of veratrum, feeble as he was by the wasting fever of so many days, added to which was the exhausting hemorrhage from his bowels.

Medicines are not to be discarded because they may be harsh or severe in their action. In this event many of the most valuable articles of the *materia medica* would be laid aside. Proper caution should be exercised in their use, and their proper place and range in the treatment of disease should, by careful observation, be sought out and determined. It must be conceded by all who are well acquainted with the effects of veratrum upon the human system, that there is no medicine, the use of which is safe, that has equal power in slowing the action of the heart and arteries, and reducing the temperature of the body.

There may be idiosyncrasies or conditions wherein we may be disappointed in our expectations of the system tolerating the medicine, or reducing the pulse; but those are in respect to veratrum wonderfully rare, and the conditions succedant to its administration are so desirable, and so nearly invariable when given in proper doses and at proper intervals, that we are not, in our judgment, to be condemned for its use.

The authority (Dr. Stillé) to which reference has already been made remarks: "There is but one class of cases in which the utility of this medicine is presumable,—cases of imminent, or commencing congestion or inflammation, in which the maintenance of its sedative action on the heart for a short period of time allows the conservative powers of the system to operate within normal limits." The principle here laid down, we think, a true one, and will practically subserve important ends, and must have a range of no mean extent. In all cases of pneumonia in its first stage, or that of congestion, this remedy is one of extraordinary power, and in many cases will avert the attack. Pushed to the extent of nausea and vomiting, which is attended by the copious discharge of viscid mucus from the air-passages, with circulation and respiration slowed, we have conditions which, if maintained, allow the conservative powers of the system to operate within normal limits, and the result generally will be a speedy convalescence. But it is true the large majority of the cases of pneumonia to which the physician is called are found

in the second stage, or that of hepatization, so that the lung tissue is filled with blood, which being fixed therein, we cannot expect to arrest the attack at once, or speedily free the lung from the disease; but surely it is desirable to place the conservative forces of the system in a condition to operate within, or as nearly as possible to, normal limits. In this disease the adult pulse will usually be found from 110 to 120, with respiration rarely less than 30, and a temperature of 102° to 104° . Let the pulse be slowed, say to 70 beats, respiration 22 to 24, temperature to 100° , the sufferer will be far more comfortable, but little more than half the amount of blood is carried through the lung in a given time, and what passes must be more thoroughly oxygenized, the crippled and overloaded lung will have far better opportunity to free itself from stagnant blood and resume its normal function; especially will this be true if the above-named conditions be maintained for a number of consecutive hours. Besides, if mercury is to be relied upon at all, it is much more certain to produce its specific action upon the system than when resisted, as it always is, by the state of febrile reaction. If blisters, upon which much reliance is placed by many high in authority, are used, it will be found that their action will be more satisfactory than if applied when the system is under the excitement of the pulse of 120 beats per minute. We have for from three to four, and sometimes for six, days kept patients unremittingly under the influence of veratrum, with no untoward results, but on the contrary, the stage of hepatization would quietly return to the stage of congestion and convalescence, and that even without mercury or blisters. In typhoid fever we have kept patients for twelve consecutive days under its influence, with no vomiting, not even nausea, which I doubt not can be done in this disease with more certainty than in some other diseases, for the reason that the nervous sensibilities are blunted and less amenable to excitants. If the muscular tissue of the heart frequently becomes softened, and thereby a cause of death, as Mr. Stokes, of Dublin, has shown in his work on fevers, why may not its force be materially preserved by slowing its action, giving it less to do? And may it not be that inflammation of any vital organ will be less likely to supervene while the circulation is more nearly normal, and may we not with reason look for a more speedy return of all the vital forces to the normal state?

As a remedy in the convulsions of children it has unwonted power, for it meets the indications, and removes the conditions which gave rise to the attack. The rapid pulse comes down, the overloaded brain is freed, the temperature falls, and oftentimes unusual quiet succeeds, and almost without exception the child for the time is rescued from danger, it may be from death. Nor are we hindered by the inability of the child to swallow, because the medicine may be given hypodermically, which indeed is the preferable method, for no time is to be lost in convulsions.

In puerperal convulsions it has been used with gratifying results. At a recent meeting of the Lewis County Medical Society which met in February last in Monticello, Missouri, Dr. Risk reported a case of puerperal convulsions from which we make the following extract: "Mrs. R., aged 22, a small, delicate, nervous woman, in the eighth month of her first pregnancy, received a fall about 6 A. M., September 18th. She made no complaint until about 1 P. M., at which time she suffered from severe headaches that came on and passed off at intervals of an hour or two, then nausea coming on she stepped to the door for fresh air, when the headache came on with increased violence. She then took to her bed, and immediately went into a most violent eclampsia. I was summoned, and arrived at the sixth convulsion. Consciousness did not return after the first spasm. There was no œdema perceptible; blood oozed from the mouth from injury of the tongue; breathing stertorous; pulse 120; no dilatation of the os; swallowed some liquids during the intervals of the spasms; administered chloroform freely, which prolonged the intervals but would not stop the convulsions, which returned upon the least withdrawal of the chloroform. I called Dr. J. R. Lucas into consultation, who strenuously advocated Norwood's tinct. verat. vir. in thirty-drop doses. This I thought heroic, but, remembering that Dr. Southworth, in the *Detroit Medical Journal*, Jan. 1877, says: 'My treatment of the apoplectic form is twenty to thirty drops of Norwood's tinct. verat. vir., and repeated every half-hour if necessary;' and that Dr. Fordyce Barker, in the *Buffalo Medical and Surgical Journal*, March, 1877, related a case in which he 'gave veratrum viride in ten-drop doses, repeated in a half-hour, and controlled the convulsion after the second dose,' we gave but twenty drops of veratrum, and watched our patient

closely. For fifteen minutes she had a slight spasm, which soon passed off. Pulse 110 and more full. Repeated veratrum in thirty minutes. In ten minutes she vomited a dark greenish mucus, and became more quiet; breathing better, pulse 100. Again, at the expiration of thirty minutes, we repeated veratrum, giving a third time twenty drops. Thus within one hour we had given sixty drops of Norwood's tinct. verat. vir., which I know to be of good quality by using it before and afterwards. Half an hour later our patient was sleeping quietly; breathing good; pulse normal; and remained mostly quiet during the night."

Surely, after such statements as the above, no one need be afraid of large doses—which, in our judgment, were repeated oftener than was necessary, because it requires an hour and ten to fifteen minutes for the full effects of the medicine to be realized when given by the mouth.

Reasoning by analogy, veratrum would be most decidedly indicated in scarlatina. We have never had the misfortune to encounter this disease, but would without hesitation incline to its use. The accelerated pulse, the intense heat of the body, with the condition of throat observed in the anginose form, would, in our judgment, be met by the effects of veratrum.

In hypertrophy of the heart, and all valvular diseases of that organ, the power of veratrum in slowing the pulse, and calming the strokes of the heart, will be found a valuable means of increasing the comfort of the patient, and it may not be too much to say, in prolonging his life. It may be used with satisfactory results in acute articular rheumatism, nor will it interfere with the simultaneous use of other remedies. We are inclined to the opinion, from observation, that besides its power in reducing the circulation, and aiding the action of other remedies, it has a specific power in this disease.

In puerperal phlebitis, puerperal peritonitis, and puerperal fever, it will be found by reference to the work of Dr. Fordyce Barker, named above, that he makes favorable mention of veratrum viride as a remedy, and commends its use in unqualified terms.

In a word, it may be said that this medicine has a range as extended as we find congestions and inflammations in sthenic conditions of the system.

PREPARATIONS.

I have never used other than the tincture, though I do not doubt that the fluid extract which is now officinal is equally reliable. The tincture should never be made with less than eight ounces of good root to a pint of full-strength alcohol, yielding what is commonly recognized as a saturated tincture.

It is generally advised to begin with small doses, increasing them until the desired effects are produced, but I prefer, where the vascular excitement is high, the symptoms urgent, and the resistance likely to be decided, to begin with a dose sufficient to impress the system at once, for, when beginning with small doses and increasing them slowly, the system does not so readily respond to the influence of veratrum.

With adults begin, say, with ten to twelve drops, and, if the influence from this dose is not decided within an hour and fifteen minutes, give not less than eight drops, and rarely will it be found necessary to repeat the dose more than three times before the system is markedly under its influence, after which five or six drops every three hours will be sufficient to perpetuate its effect. In some instances it will be found with this, as with other medicines, that the system will be impressed by smaller doses, and occasionally a system will be found so sensitive that it will become necessary to divide even a drop.

If used hypodermically we should not begin, ordinarily, with more than four drops, repeating it in smaller doses every twenty minutes until the patient is sufficiently brought under its influence.

MINUTES OF THE SECTION
ON
OBSTETRICS AND DISEASES OF WOMEN
AND CHILDREN.

1877-1878

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MINUTES OF THE SECTION

ON

OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN.

TUESDAY, May 6.

THE Section was called to order by the Chairman, Dr. E. S. LEWIS, of Louisiana. As there was a vacancy in the Secretaryship, on motion of Dr. MARCY, of Massachusetts, Dr. ROBERT BATTEY, of Georgia, was elected to fill it.

Dr. BATTEY read a paper upon *Tubo-ovarian Pregnancy—case—operation in fifth month—death*. The author asked that the paper be returned to him, with authority to publish it in one of the medical journals, for want of novelty or sufficient interest to warrant publication in the Transactions of the Association. Granted.

An essay upon *Electrolysis of Fibroids*, by Dr. E. CUTTER, of Massachusetts, was read in part and referred to Dr. DUNSTER, of Michigan, to be examined and reread to-morrow.

Dr. E. S. DUNSTER, of Michigan, offered some remarks advocating the practice of keeping the bowels free after the operation for perineorrhaphy, and asked the experience of members of the Section.

Dr. M. A. PALLAN, of New York, added his testimony as to the success of the practice.

Dr. JAS. KING, of Pennsylvania, approved the use of saline cathartics in conjunction with opium to allay pain and secure rest.

Dr. ALBERT H. SMITH, of Pennsylvania, had had no experience in the use of salines, but thought well of the method on theoretical grounds.

Dr. G. DOWELL, of Texas, had had favorable experience in the use of the laxative just previous to the withdrawal of the sutures.

Dr. DUNSTER, of Michigan, desired to have also the experience of members as to the best suture to be used in perineorrhaphy, and operations for rectocele, etc.

The subject was discussed by Dr. V. H. TALIAFERRO, of Georgia, Dr. G. DOWELL, of Texas, Dr. R. BEVERLY COLE, of California, Dr. PALLAN, of New York, and by the President, Dr. PARVIN, of Indiana.

On invitation, Dr. PALLAN, of New York, exhibited several new pessaries of his own modification.

On invitation, Dr. H. F. CAMPBELL, of Georgia, exhibited and explained his modification of the stem pessary, being a soft rubber tube inclosing a delicate spring. Discussed by Dr. TALIAFERRO, of Georgia.

Upon motion of Dr. SMITH, of Pennsylvania, the discussion of pessaries was made the special order for Thursday afternoon. Adjourned.

WEDNESDAY, May 7.

Section called to order by the Chairman. Minutes approved.

Dr. MARCY, of Massachusetts, presented the gynæcological table of Dr. CHADWICK, of Massachusetts, and explained its uses.

The essay of Dr. E. CUTTER, of Massachusetts, upon the *Treatment of Uterine Displacements by the Stem Pessary*, was read by Dr. LEWIS, of Louisiana.

Dr. E. B. TURNIPSEED, of South Carolina, presented a new uterine speculum and dilator, with cases; also, newly invented surgical instruments for facilitating, simplifying, and rendering more certain the operations for vesico-vaginal and recto-vaginal fistulæ, staphylorrhaphy, harelip, and hernia, as well as closing the lips of wounds of any part of the body, with operations and their results.

On motion of Dr. SMITH, of Pennsylvania, an expression of the thanks and appreciation of the Section was tendered Dr. TURNIPSEED for his remarkable mechanical ingenuity as exhibited in the invention of the various instruments shown.

At the request of the Chairman, Dr. DUNSTER, of Michigan, read the essay of Dr. E. CUTTER, of Massachusetts, upon the *Electrolysis of Fibroids*, which, upon motion, was referred to the Committee of Publication.

Dr. PALLAN, of New York, exhibited a series of drawings illustrating his method of operating in lacerated perineum, with

explanatory remarks. He also explained, with illustrative drawings, his method of transplanting the vaginal insertion upon the cervix uteri, termed by him "vagino-cervioplasty."

Dr. BEVERLY COLE, of California, asked the results obtained by the latter operation.

Dr. PALLER replied that one of his patients had subsequently borne a child, two cases had passed beyond his observation, and two had been so recently operated upon that the results are not yet ascertained.

The Chairman appointed Drs. DUNSTER, of Michigan, SMITH, of Pennsylvania, and CROSS, of Arkansas, a committee to examine and report upon the papers presented to the Section. Adjourned.

THURSDAY, May 8.

Section called to order by the Chairman. Minutes read and approved.

On motion of Dr. BATTEY the discussion of the address in Obstetrics of the Chairman, referred to the Section by the Association, was made the first business in order.

Dr. J. K. BARTLETT, of Wisconsin, having been called to the chair, the discussion was opened by Dr. SMITH, of Pennsylvania, who alluded to the changing, by external manipulations, of the presentations and positions of the fœtus in utero in the eighth month of pregnancy. These changes can in many cases be effected with ease, and with great advantage. His efforts to convert an occipito-posterior position, however, into an anterior one, and to maintain it thus, had been uniformly unsuccessful. There is something peculiar in these cases which renders them very rebellious. He does not feel that the question whether the cord is to be ligated early or late after labor is an important one. His practice is to ligate as soon as pulsation in the cord has ceased. To a question, he answered that he does not bandage the abdomen after turning the child in utero.

Dr. H. O. MARCY, of Massachusetts, remarked upon Dr. GARLAND's method of treating prolapse of the cord by rotating the body of the fœtus in the uterus, and thus winding the cord around the body of the fœtus. He has had favorable experience himself of the use of this method. He thinks there is decided advantage in the late ligation of the cord. Upon the subject of bandaging the abdomen before delivery he mentioned the use which he

makes of the Esmarch's rubber bandage for supporting a pendulous abdomen. It not only supports the relaxed walls, but stimulates uterine contractions also.

Dr. MORRIS, of Ohio, doubted both the propriety and the success of these efforts to turn the child in the eighth or ninth month. Fears that dangerous consequences might ensue. He has failed to turn in these cases entirely by the external method. Desired to ask why select the eighth month for turning in place of the ninth?

Dr. LEWIS explained that the manipulation is then effected with greater ease and safety.

On motion of Dr. L. F. WARNER, of Massachusetts, Dr. BATTEY was requested to recommit the paper upon tubo-ovarian pregnancy, read by him on Tuesday, to the custody of the Section, and that the same be transmitted to the Committee of Publication with a request that it be published in the Transactions.

Dr. ALBERT H. SMITH, of Pennsylvania, opened the discussion on pessaries, the same being the special order for the day. The pessary is inappropriate when the uterus is enlarged and inflamed, when there is hyperplasia or abnormal growths. Its place is chiefly in simple displacement without any complications, but it may be used as an aid to other treatment by supporting an inflamed organ. No pessary should be used which destroys the mobility of the uterus. It should make no undue pressure upon any of the tissues with which it comes in contact. It should not interfere with fecundation. It must have a uniform basis of support. He explained the natural supports of the uterus, and then discussed the principles involved in the various classes of pessaries which have been offered to the profession. He criticized the pessaries of Dr. Pallen, and also the suggestion of Dr. Campbell, of Georgia, to introduce pessaries in the genu-pectoral position. He regards the stem pessary as an evil which is only to be justified by a positive necessity for its use. Thinks no intrauterine stem should be attached to any fixed support.

Dr. PALLEN, of New York, differed *in toto* with Dr. SMITH in the etiology of uterine displacements, and explained, by reference to the anatomy of the tissues concerned, his own opinions. He approved of a properly constructed Hodge's pessary, and especially of the modification of Dr. SMITH, but he deprecated the use of the large and badly constructed Hodge instruments sold in the shops, and he wholly differed in his views of the *modus*

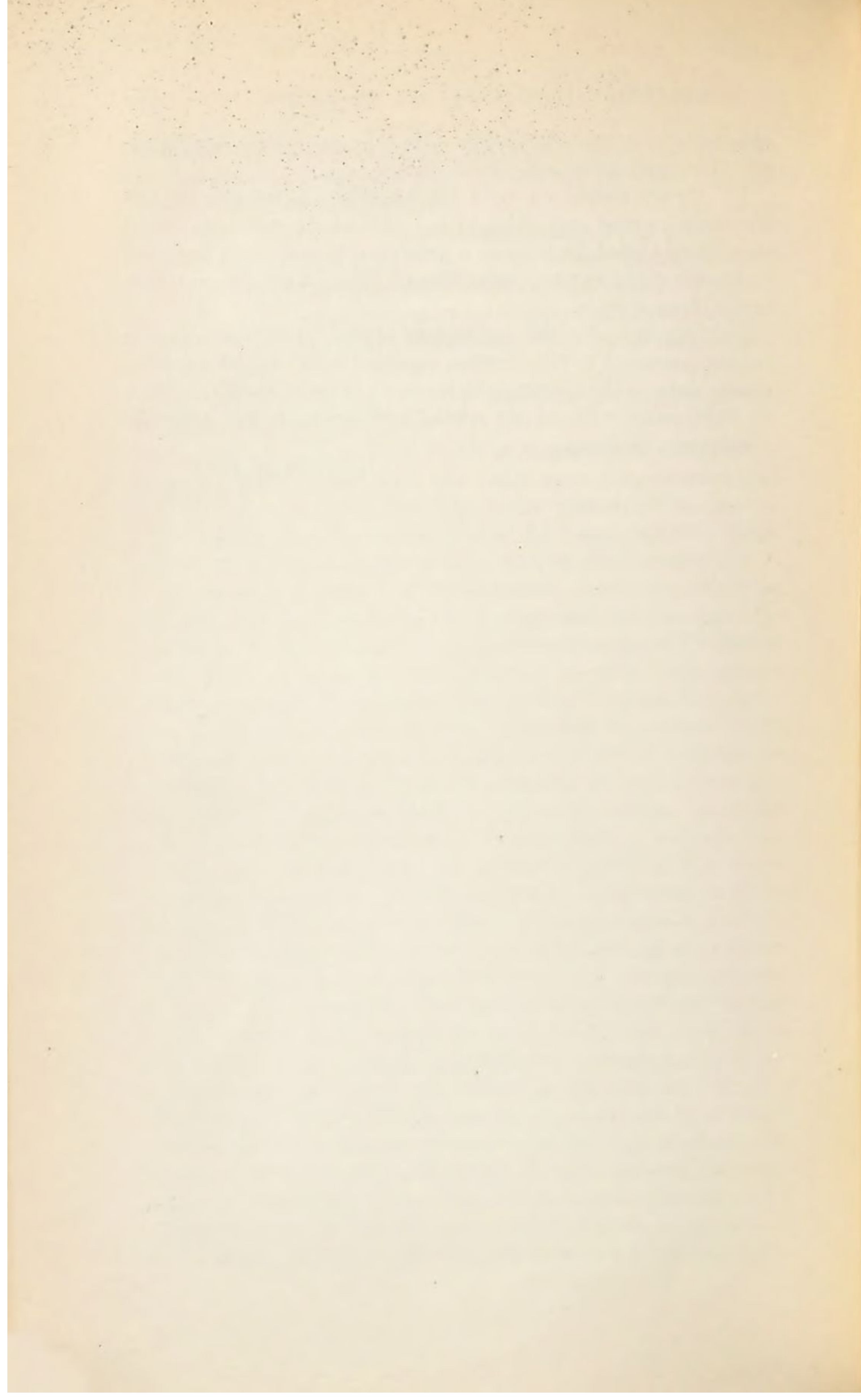
operandi of its remedial action. He then explained the principles involved in his own modifications.

Dr. MARCY moved a vote of thanks to Drs. SMITH and PALLEN for their learned exposition of the subject discussed, and that they be requested to prepare a brief synopsis of their remarks, to be submitted to the Committee of Publication for insertion in the Transactions.

Dr. DUNSTER, for the committee appointed to consider the papers presented to the Section, reported back the essays, with instructions to the Secretary to transmit them to the Committee of Publication without any special recommendation. Adopted.

Section adjourned.

ROBERT BATTEY,
Secretary.



ADDRESS IN OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN.

By E. S. LEWIS, M.D.,
NEW ORLEANS, LA.

THE aspirations of medical men to original conceptions and initiative action are eminently displayed in the widely divergent theories and means of cure advocated in current medical literature. Striking the imagination rather than the reason, their ephemeral existence is the measure of their instability, as viewed in the light of progress. Amidst this profusion of heterogeneous and ill-digested matter, the weakly abortions of speculative vagaries, the reflections of matured thought and enlarged experience find a place, confirming and strengthening our knowledge, and extending the sphere of professional usefulness.

The utilization of *Abdominal Palpation* to diagnosis in Obstetrics for the simplification of labor, is a new field opened to us by Dr. Pinard.¹ The substitution of the vertex for other presentations of the foetus before labor, by external version, is the most natural *reflection* of this process, and its retention at the brim by artificial support the objective point of his work.

As a matter of history, abdominal palpation in diagnosing presentations can be traced to Wiegand in 1812; and later Schroeder, Shaadwick, and Otto of Spiegelberg, have testified to its value. In France, since 1862, Tarnier and Guyon taught it to their pupils; and in England allusion is made by Playfair, in a short paragraph, to its utility, and to the possibility, under favorable circumstances, of altering abnormal presentations before labor begins. As remarked by Dr. Thevenot, the work of Dr. Pinard "assigns a place in practice to a method of exploration too long neglected."

In the discussion of malpresentations, relaxation of the abdo-

¹ Annales de Gynécologie, Dec. 1878.

minal walls in multiparæ is considered an important factor. The inefficient support of the uterus occasions a loss of parallelism in the uterine and pelvic axes, which prevents the adaptation of the head at the brim, and disturbs the harmony of accommodation to which vertex presentations are ascribed.

In the illustration of his method, the dorsal position is preferred, with the head slightly raised, and the lower extremities extended and separated. The hands on each side of the linea alba and the tips of the fingers just above the horizontal pubic rami are pressed deeply into the pelvic cavity downwards and backwards. Either no resistance is met with, except that offered by the soft parts, or a hard round voluminous body is felt, which is the head in flexion, as it only can occupy the cavity. Moreover, as the tumor is always more accessible and prominent on one side—which is the frontal portion—the position can be defined. A similar examination over the fundus, with the hands reversed, recognizes the breech, an irregular voluminous mass of less density than the head, with projecting parts, the knees and the feet. The greater resistance on one side of the long axis of the uterus shows its occupation by the foetal trunk.

In his methodical grouping of facts from the signs furnished by palpation, in the different presentations and positions confirmed during labor, a system is developed, easy of application, and of practical usefulness. The capital idea, establishing its value and evincing progress, is the conversion of pelvic and shoulder presentations into those of the vertex, with reduction of risks in labor, and avoidance of formidable operations. The time most favorable to effect this change is fixed at the eighth month, in view of the greater mobility of the foetus than at the end of gestation; and an abdominal bandage secures the position. The compression exerted is not hurtful; it should at first be moderate, then increased and continued until the head is engaged in the cavity, or till the advent of labor.

The simplicity of this practice and its easy accomplishment, with the advantages offered, will insure its recognition and acceptance by obstetricians, and Prof. Tarnier, when he says “he has failed in his duty who omits so simple a means of deriving information,” does not exaggerate its importance.

Not less conservative and of wider scope is the *Antiseptic Management of Labor*, to which the Germans and English have given

much attention.¹ Led by the success of Listerism in surgery to its modified application in obstetric practice, the results obtained have been most satisfactory. The committee appointed by the Berlin Obstetrical Society have recommended its general use in Germany as the prophylaxis of septicæmia. Infecting materials gain admission, they report, in two ways: "First, and this happens more especially in very difficult and long labors, under the influence of the particles that cause putrefaction, which are ever present in the air, and ever ready to press in; decomposition occurs in the mother's own secretions and excretions, and thus takes its rise in the maternal organism itself; or, secondly, these materials are introduced into the female genital canal from outside." That the latter is the most frequent cause of infection, is the opinion of Dr. Le Tort.² He regards epidemics of puerperal fever as due to contagion, and that midwives as well as physicians are the media of transmission. The experiments of Tyndall, Pasteur, and Roberts³ show "that it is with the greatest difficulty that their prepared fluids can be kept free from the contamination of septic germs, which not only float in the atmosphere, but may adhere to every instrument, and to every vessel, as well as to the hands and clothes of the operator." When it is considered that, as stated by Tyler Smith, "three thousand mothers die annually in England and Wales from puerperal fever," the antiseptic treatment of labor rises in importance, and removes the objections its annoyances entail.

The methods of Bischoff and Zweifel, though differing somewhat in their details, prescribe cleanliness in the parturient woman and her surroundings; the use of antiseptic injections in the vagina in the beginning and at intervals during the course of labor; and the thorough disinfection of the hands before, and inunctions with carbolized oil during examinations.⁴ Immediately after delivery the vagina is injected, as well as the uterus, should its cavity have been entered by the hand; and during the puerperal state vaginal injections are continued daily. The vulva and perineum are protected by a pad soaked in the ten per cent. oil, which is frequently renewed.

Since the adoption of this practice by Bischoff, "the number

¹ London Lancet, June, 1878.

² *Annales de Gynécologie*, April, 1878.

³ London Lancet, 1878.

⁴ *Medical Times and Gazette*, March 30, 1878.

of cases in which morbid symptoms were present, consisting in a febrile temperature of more than two days' duration and reaching to $101\frac{1}{8}^{\circ}$ F., at least on one day tenderness over the abdomen and fetid discharge, averaged 16 per cent. for six years." The results obtained by Zweifel are equally satisfactory, and Spiegelberg of Breslau reports but five deaths in 900 labors since 1874.¹ Dr. Newcombe remarks, "When we consider that seldom an operation, be it a minor or a major one, is now performed without antiseptic precautions,—without carefully excluding the access of air to the wound, without surgeons, nurses, etc., carefully disinfecting their hands in carbolic solution,—and that these measures have so lessened the danger that operations are now performed at times and places never dreamt of, is it not just that the lying-in woman should have the same immunity accorded her and the risks removed from septic poisoning?"

On *Puerperal Fever* many interesting papers have been published. It is assumed by Dr. Strange,² whose views are shared by Stuart and Tilt, that the poisons of the specific zymotic diseases never produce septicæmia, but always breed true;" that those cases not running the ordinary course of the zymotic disease are a compound of the zymotic and septic poisons circulating in the blood at the same time. This additional infection, remarks Dr. Stuart, is all the more likely to occur when a specific zymotic poison holds possession of the blood, vitiating and rendering unhealthy, and thus more liable to rapid decay, all the secretions and discharges of the body. The conclusions arrived at by Dr. Frankl,³ from his analysis of the various theories of its etiology, that "the agent of infection is the putrid and decomposing secretion of the wound," may be regarded as the sum of our positive knowledge. The recent discovery by Pasteur of a germ which he believes is the cause of infection promises an early solution of this question.⁴ He has met with the same in the pus from a girl with surgical pyæmia, and in his investigations in the wards of Hervieux, of Maurice Reynaud, and in the Lariboisière hospital, where he has had frequent opportunities of

¹ Obstet. Journal of Great Britain and Ireland, April, 1878.

² London Lancet, p. 450, 1878.

³ American Journal of Obstetrics, April, 1878.

⁴ Gazette des Hôpitaux, March 11 and 27, 1879.

examining the blood and secretions in puerperal fever, he has shown the constant presence of this organism. He describes it as of a spherical shape, sometimes found in twos or in fours or arranged like the beads in a rosary. A drop of blood from the finger of an infected patient contained the same vibrio, which cultivated produced the same organisms unmixed with any other. His success in the exposure of other active agents of disease excites the hope that in this he is not deceived, and that soon this hidden and terrible enemy of man will stand revealed.

The resurrection of *Laparo-Elytrotomy* by Thomas,¹ and the success thus far obtained in this country, has raised a formidable rival to the Cæsarean section, and bids fair to supplant it in the future. In England, though the result has proved fatal in the two cases of Drs. Heric and Edis, the circumstances were such as to determine the choice of the measure, thus offering some hope which the Cæsarean section precluded, from the degree of exhaustion and the complications existing.² In the cases operated on, both here and in England, scarcely any hemorrhage occurred, whilst the risks from peritonitis and infection are certainly lessened. Its performance, according to the testimony of those who have practised it, is easy and expeditious, since it has been completed in from twenty to forty minutes. The operation of Porro, of Pavia, or rather that of Dr. Storer, as he was the first to perform it (in 1869), consisting in the removal of the uterus and ovaries after the Cæsarean section, has met with much favor and success on the continent, where, of fifteen cases thus operated on, seven have been saved.³ Before its inauguration the Cæsarean section had invariably proved fatal in that city and in Vienna, and, according to Dr. Imbert, of forty-one cases collected by him in Paris not one had recovered.⁴ The first operation by Porro was in 1875, the uterus and ovaries being extirpated to obviate impending death from hemorrhage after the Cæsarean section, his patient making a rapid recovery. Spaeth, of Vienna, next followed, and reported two recoveries and one death. As modified by Mueller, the operation is bloodless. The abdominal walls are incised to the umbilicus, and the uterus, lifted out of

¹ American Journal of Obstetrics, April, 1878.

² British Med. Journal, Nov. 20, 1878. London Lancet, July, 1879.

³ Chicago Med. Journal and Examiner, March, 1879.

⁴ London Medical Record, May, 1877.

the cavity, is constricted at its cervical portion by the chain of an *écraseur* without cutting through the tissues. This permits the extraction of the *fœtus* through the uterine wound, without hemorrhage, and the escape of amniotic fluid in the peritoneal cavity. All above the constriction is then removed with the knife, and the neck fixed externally is treated like the pedicle of an ovarian tumor. By this means it is claimed all danger of hemorrhage is prevented during and subsequent to the operation, and the liability to infection and peritonitis materially lessened.

The series of interesting and exhaustive papers by Dr. Harris,¹ on the Cæsarean operation in this country, in which 102 cases are reported with a percentage of $55\frac{5}{8}$ recoveries, show a much more favorable result than was expected, at least in country towns and places, though in the large cities of the United States the mortality is nearly if not equally as great as in the large cities of Europe. The difference may be due to the greater danger of infection in cities, and to exhaustion, as midwives are usually employed before the obstetrician is called. Notwithstanding the favorable views entertained by Dr. Harris of this operation under circumstances and conditions not in themselves increasing the risks of delivery—as inertia and exhaustion—he yet admits the generally fatal result of its performance in protracted labor when exhaustion has supervened and inertia has followed, and concludes that in such conditions the operation of Thomas is to be preferred.² Contrasted with these different methods of abdominal ovotomy laparo-elytrotomy is a compromise of safety; neither involving the uterus nor the peritoneal cavity, it implicates but one organ, the vagina, with a possible risk to the bladder, which subsequent experience may find means to obviate. It is less repulsive in its features, sufficiently easy of execution, and better adapted for the majority of cases which fall under notice when the conditions exist which preclude hopes of success from the Cæsarean section. The statistics furnished by the large cities of Europe and the United States speak more forcibly than the objections raised, that the Cæsarean section has been “weighed in the balance and found wanting,” and, in the auspicious dawn of the conception of Jorg as rehabilitated by Thomas, and in the more radical operation of Porro and Mueller, a more promising future is in store for the

¹ American Journal of Obstetrics, Jan. 1879.

² Ibid.

unfortunate women whom nature or accident condemn to delivery through an unnatural channel.

In several interesting papers some very useful measures are proposed for shortening the second stage of labor.¹ The method of *digital dilatation of the os*, as practised by Wm. Stephenson, appears free from the objections generally attached to such interference. It is applicable when the membranes are ruptured before the complete dilatation of the os, and the cervix, pushed down with each pain before the head, does not yield and recede over it. His object is to effect the extrusion of the occiput through the os, which secures greater flexion, and facilitates rotation. He directs the introduction of one or two fingers of the right hand within the os opposite the thyroid foramina in first and second positions, and the sacro-iliac junction in the third and fourth, with which it is supported or lifted during each pain.

In delay from *spastic rigidity of the os*—which Playfair ascribes to irritation from pressure of the head upon the tissues of the cervix after premature rupture of the membranes, and to “constitutional peculiarities, as a highly nervous and emotional temperament, which renders the patient peculiarly sensitive to her sufferings, and interferes with the harmonious action of the uterine fibres²—the use of *atropia* injections into the cervix is recommended by Dr. Horton. His success in the eight cases he reports justifies a more extended trial with this agent, and, though the quantity injected at one time was $\frac{1}{40}$ of a grain, it was followed by no unpleasant effects, with the exception of dilatation of the pupils and some dryness of the throat. The needle he employs is curved at its extremity, introduced within the os, and by slight traction hooked into the cervix.

The *Primary Conversion of Occipito-posterior into Occipito-anterior Positions* is recommended by Dr. Doughty as a means of simplifying labor.³ The time most propitious is at the close of the first stage, when the head is still sufficiently movable to be changed, and sufficiently low to facilitate action. The rotation of the occiput forwards is effected by pressing with one or two

¹ Obstetrical Journal Great Britain and Ireland, August, 1878.

² American Journal of Obstetrics, July, 1878.

³ Ibid., 1878.

fingers on the temporal bone in the interval of a pain, so as to direct the forehead into the hollow of the sacrum. This, if easily accomplished, has superior advantages to the same practice at other periods of labor, and obviates the necessity for instrumental interference, whether the fillet be used as recommended by Hodge, the vectis by Goodell, or the forceps by Tyler Smith and others. True, as stated by Playfair, the forward rotation takes place naturally in the majority of cases, but occasionally it does not, and is the cause of delay and of danger from protraction and laceration. This suggestion of Dr. Doughty, whilst simple and easy of performance, is rational and practical, and, in defining the proper time for its execution, he has contributed to our means of relief.

As a simple and effective means of arresting *Post-partum Hemorrhage*, Prof. Penrose¹ habitually employs vinegar, introduced on a piece of rag into the uterine cavity and pressed firmly against its walls. In his hands it has invariably succeeded in exciting the most sluggish uterus to contraction, and in constringing the mucous membrane, and it possesses besides some antiseptic properties. It is readily obtained, and its use is less objectionable than that of iodine and the perchloride of iron.²

Compression of the abdominal aorta, the origin of which is ascribed to Plouquet and Saxtorph, has enabled Dr. Bradley to save three patients whom he believes would otherwise have died. As remarked by the author, "nature's tourniquet is always ready," and, promptly resorted to in desperate cases, is the means of preventing the loss of the last two or three ounces to which, according to Barnes, the death of the patient is directly due. Dr. Gorriquer Griffith³ reports several cases saved by this means, and recommends, for the better control of the uterus, bimanual compression, one hand being introduced into the rectum.

The use of hot water injections to arrest post-partum hemorrhage was brought to European notice by Dr. Whitwell, of San Francisco, in 1875, though recommended several years before by Dr. Emmet. In the hands of Windelband it has been used with the happiest results in hemorrhages from abortion and placenta

¹ American Journal of Obstetrics, 1878.

² Obstetrical Journal of Great Britain and Ireland.

³ Ibid., 1879.

prævia. Its employment as an hæmostatic is not new in the history of medicine, and it was employed by Trousseau for the arrest of epistaxis. With these measures when required, the use of ergot, and proper manipulations of the uterus, the cases must be few indeed requiring measures which though efficacious are in themselves a source of danger.

The Principles of Tying the Umbilical Cord, as enunciated by Budin in 1875-6, are confirmed by the experimental observations of Schücking and Helot in 1877, and by the more recent studies of Zweifel and Hoffmeier in Germany, and of Porack and Ribemont in France. By the immediate ligation of the funis, the foetus sustains a blood loss of 92 grammes, as estimated by Budin,¹ from which it profits when tied a half minute to four minutes after the cessation of pulsations. This, if it is admitted with Béclard, from the experiments of "Welcker, Bischoff, and Vierordt, that the weight of the blood represents about the thirteenth part of the total weight of the body," would show a loss equal to about one-third the weight of the blood.

By means of very sensitive scales, Schücking and Helot² observed an average increase of 62 grammes in the weight of the foetus two minutes after the pulsations in the cord had ceased, and the blood collected from the placenta after division of the cord averaged 13 grammes, with an average of 99 grammes after immediate ligation and division. Furthermore, from the analyses of Helot, there are about 902,632 red corpuscles more to the cubic millimetre of blood after the tardy than after the immediate ligation of the cord. The penetration of the blood into the circulatory system of the child when the pulse in the cord has ceased is ascribed by Budin to thoracic aspiration, aided by uterine contractions, according to Schücking and Porack. The comparative effects upon the foetus are not less important, as demonstrated by Ribemont. In two series of 23 children each, the immediate and tardy ligation was practised in an equal number of cases. The average weight of the 23 treated by immediate ligation was 3141 grammes at birth, and on the tenth day 3082, thus showing a loss of 59 grammes. If to the weight on the first day had been added 92 grammes, the average amount of blood left in the placenta, the average weight would have been 3233

¹ Annales de Gynécologie, Feb. 1879.

² Ibid., Oct. and Dec. 1874.

grammes, thus showing a loss of 151 grammes on the tenth day. The average weight in the series treated by tardy ligation was 2970 grammes at birth, and on the tenth day 3.071, an increase in weight of 101 grammes. In only this series was there observed an increase of weight on the ninth and tenth days. We have therefore an average loss in the first of 151 grammes, and in the second an average gain of 107 grammes on the tenth day. Adding the gain to the loss, and we find a loss sustained by the children in the first series equivalent to 252 grammes. The conclusions of Zweifel, Hoffmeier, and Schücking are equally significant. Therefore, regarding the blood in the placenta as belonging to the foetus, Zweifel,¹ in his clinic at Erlangen, teaches the late ligation of the cord,—whenever practicable, after the expulsion of the placenta, when this organ is compressed in both hands, and all the blood squeezed out of it and the umbilical cord into the child. The experiments of Schücking have, however, demonstrated that the child receives most of the utero-placental blood in the first two minutes after the pulsations have ceased, at which time the ligature may properly be applied.

Dr. Matthews Duncan,² to whom Obstetrics as a science is indebted for the solution of many important problems, is disposed to question the utility of *Traction by the Lower Jaw in Head-last Cases* in producing flexion. He remarks that, as the force applied is at the temporo-maxillary articulation, and but very little in front of the centre of the head's mass, traction has a certain tendency to produce flexion, but with the application of a force dangerous to the child. The limit of the force which can be used safely, he considers as not far short of fifty pounds; and in his experiments on the dead foetus, even when a force of fifty-six pounds was used, causing dislocation of the jaw and laceration of the soft parts, the flexion produced was inconsiderable. Uterine expression, as advocated by Penrose, Playfair, and Thomas, is not without danger, he states, as the force employed cannot always be regulated or estimated, and it is not proved that the mortality to the foetus is thereby materially affected, as we have no reliable statistics to guide us. In primiparæ, the more rigid and unyielding soft parts often more than counteract

¹ American Journ. Obst., Jan. 1879.

² Obst. Journ. of Great Britain and Ireland, April, 1878.

the effects of pressure within safe bounds, which is often inadequate, disappointing, and fatal. Whilst the earlier and more frequent use of the forceps in head-first cases furnishes an inexhaustible theme, as shown in the richness of its literature, by a strange inconsistency but few appreciate their importance in head-last cases. Some, indeed, as Dr. Agnew,¹ apply them to the breech in impaction, and special forceps have been devised by Dr. Miles² for this purpose, but their value for the delivery of the head, when every second lost is perilous to the child, is not properly rated. Nay more, so high an authority as Prof. Penrose³ alludes to instrumental interference as a "rough and unintelligent application of unnecessary and badly applied force;" and, *per contra*, Matthews Duncan says, of expression and spiral traction, "that they are attended with considerable danger." The success of Busch, of Berlin, as quoted by Dr. Fauntleroy, is ascribed to the application of the forceps to the after-coming head.⁴ In forty-four cases thus delivered, he lost but three children; and in four of my breech cases thus treated in primiparæ, there was a saving of four foetal lives, that would otherwise have been lost, and in which no injury accrued to the mothers. It is believed that their early use is not only justifiable, but is the best possible and safest means of reducing infantile mortality to its minimum. Their application is easy and rapid when the head has rotated, and, as it is associated with expression by an assistant, or bystander, no time is lost, and the additional power obtained increases the possibility of safe delivery. Before the expulsion of the breech the forceps should be at hand, and the woman in position to use them with advantage.

In *Gynecic Surgery*, which American genius and skill have so successfully labored to advance, we find marked evidence of progress. The censure and condemnation of total extirpation of the uterus in cancer, the brilliant success of Freund by his method, and of Schroeder, has silenced, besides adding to our means of relief if not of cure. Of ten cases thus operated on by Freund, five have recovered, and so far the disease has not returned.⁵ It offers the alternative of relief if not of cure to a death inevitable,

¹ Ibid., Nov. 1877.

² American Journal of Obstetrics, Jan. 1879.

³ Monthly Review of Medicine and Pharmacy, Feb. 1879.

⁴ American Journal of Obstetrics, Jan. 1878.

⁵ Ibid., 1879.

painful, and lingering. Three ligatures secure the vessels in the broad ligaments, the last, passing through the upper and lateral walls of the vagina in an antero-posterior direction, control the uterine arteries. The peritoneal reflections in front and behind the uterus are then cut through, the uterus separated from the bladder, the ligaments divided, and the detachment from the vagina effected. The transverse fissure from the peritoneal deficiency, made more narrow by traction on the ligatures, passed through the vagina, is closed with silk sutures, and an antiseptic treatment pursued. In amputations of the neck in cancer Dr. Emmet prefers the knife or scissors, and covering the stump with mucous membrane, to operations which necessitate healing by granulation.¹ He states that "tissue of this kind is of so low a grade of vitality that it would be likely to offer a better starting-point for a recurrence of the disease." Notwithstanding the high authority of Dr. Emmet, his fears seem overstrained, and are not justified by the results obtained by Thomas, Byrne, and Leon l'Abbé, who advocate the cautery loop and knife, which in their hands have proved eminently successful and are not followed by hemorrhage.

Uterine fibroids, from their frequency, the discomfort they produce, and the accidents they determine, have been much discussed in the past year. The "cardinal rule to be observed" in their treatment, remarks Dr. Emmet, "is to do nothing by which the vitality of the tumor may be destroyed while it is *in situ*, since we burden the case with the extra risk from blood poisoning. We are to employ any means by which the circulation can be reduced and continued at the lowest point short of its entire arrest. For this purpose the action of hot water injections, of iodine, and the judicious use of ergot will be found most beneficial." The use of ergotine hypodermically is chiefly relied upon by Prof. Simpson, who with Dr. Emmet questions the utility of other medications except in so far as they improve the health. The use of ergot in large doses they also condemn as injudicious—sometimes producing peritonitis and cellulitis, and by the irritation set up promoting the development of the fibroid and causing hemorrhage. For the removal of sessile growths of large size impinging on the external os, dilating it, or protruding in the vagina, Dr. Emmet employs scissors. By strong traction on the tumor the uterus contracts, compressing the bloodvessels,

¹ Diseases of Women, page 500.

obliterating the bed of the growth as drawn forwards and effecting its pedunculation, besides permitting its removal piecemeal without hemorrhage. In this way tumors of several pounds' weight have been taken out by a comparatively bloodless operation. In similar cases Prof. Thomas employs a serrated spoon attached to a handle twelve or thirteen inches long, with which, by a sawing motion at the same time that traction is made, the growth is detached from its connections.¹ The instrument devised by Prof. Simpson to effect this has a flat and sharp metal point in shape like a finger nail, and connected by a long stem to a stout handle.² This is guided by the index finger to the base of the tumor, which it detaches from its bed, "the handle being worked all the while by the left hand." Regarding other surgical procedures involving "mutilation of the tumor and production of sloughing," Prof. Thomas regards them as less in accordance with good surgery and safe practice, which is also the opinion of Prof. Simpson and Dr. Emmet.

The continued current has been successfully employed by Dr. Emmet³ to favor the expulsion of submucous growths, and he considers it safer than ergot and equally valuable. It is also strongly advocated by Dr. Martin,⁴ who claims that it exerts an electro-atrophic action, which is all he admits is produced by electrolysis, the electro-chemical action of which, as claimed by Drs. Cutter and Semeleder, he denies, whilst the risk and pain are greater than by his method and the operation is not more beneficial.

In cases not amenable to treatment by ordinary methods and necessitating other surgical measures than those mentioned to effect relief or cure, two other operations may be referred to, which have been attended with success in some instances though too dangerous to be lightly considered.

Since the introduction of spaying in gynæcological practice by Dr. Battey, the ovaries have been successfully extirpated in all five times, for the cure of fibroids, by Trenholme, Hegar, Nussbaum, and lastly by Goodell in 1877.⁵

¹ American Journal of Obstetrics, October, 1877.

² Archives of Medicine, February, 1877. Obstetrical Journal of Great Britain and Ireland, April, 1878.

³ American Journal of Obstetrics, January, 1878.

⁴ Annales de Gynécologie, March, 1879.

⁵ American Journal of Medical Sciences, July, 1878.

Extirpation of the uterus for fibroids was first brought into notice by Mr. Pean in 1873, with a report of nine cases and seven recoveries, the pedicle being fixed externally. The success of Mueller, who adopts the same practice, is equally marked, and, in his series of five cases performed for fibroids and for sarcoma of the uterus, he has not had a death.¹ As modified by Schroeder, whose method is preferred by Freund, the pedicle is dropped. Subperitoneal growths are enucleated, and the peritoneal wound sutured.² The intra-mural form situated above and not involving the broad ligaments he removes in slices, after constricting the cervix by a silk ligature passed through it at the internal os, to prevent bleeding during the operation, and which remains to restrain hemorrhage from the punctures following the introduction of sutures both deep and superficial necessary to close the wound. From so large a mass he does not fear that sufficient compression is exerted to destroy the vitality of the part above, and reports five recoveries in six cases. Notwithstanding the fears entertained and the objections made to so formidable an operation, the recent success which has followed its performance if continued must give it rank with its "twin sister ovariectomy."

With this incomplete report upon gynæcology I must now close, having occupied the time allowed by the Association. The field is so vast and the literature of the past year so voluminous as in itself to furnish abundance of material for a lengthy paper even on what might strictly be regarded as evincing progress.

¹ American Journal of Obstetrics, 1879.

² Ibid., January, 1879.

TUBO-OVARIAN GESTATION—CASE—OPERATION IN FIFTH MONTH—DEATH.

BY ROBERT BATTEY, M.D.,

ROME, GEORGIA.

MRS. H., aged 40, married, mother of five children, youngest thirteen years old. She had been a vigorous, healthy woman, reared upon a farm, and inured to hardships. Since the birth of her last child she has suffered more or less with uterine leucorrhœa. Her menses appeared for the last time about the 30th of June. In August the nipples and areolæ were turgid and much darkened in color, the breasts were swollen and contained milk. She thought herself pregnant, and experienced soreness and pain in the pelvis. These pains increased in frequency and intensity until toward the close of the month she was obliged to keep her bed. She was seen successively by several physicians, and the case diagnosticated neuralgia of the uterus, then cancer of the uterus, and, finally, retroversion of the gravid uterus.

The writer saw her for the first time on the 1st of November, four months from the last menstruation. She was now suffering much pain, and made complaint of pressure upon the bladder and rectum, by which both micturition and defecation were somewhat embarrassed. Repeated daily doses of morphia were required to render her at all comfortable. So sensitive had she become to the slightest jar that she had caused holes to be cut in the floor of her cabin, that the bed-posts might be supported from the ground beneath in such manner as to be independent of any vibration of the sleepers and flooring. She was already greatly emaciated.

By vaginal taxis the os uteri was found closely applied to the pubis and high up, and admitted the tip of the index finger. The uterine fundus was above the superior strait of the pelvis, and somewhat to the left of the median line. The organ, by

bimanual taxis, appeared to be enlarged to the size of a two-months' pregnancy. There was no uterine discharge. The sound passed four inches to the fundus. In Douglas's fossa was a large tumor which lifted the uterus upward and pressed it strongly forward behind and above the pubis. This tumor was immovably fixed in its position, and had resisted previous attempts to force it upward in fruitless efforts to reposit a (supposed) retroverted uterus. The tumor fluctuated distinctly, and, when so fluctuating, a solid body could be felt to recede before the finger and return with a well-marked impulse, which could be nothing else but a true ballottement. Fœtal movements, though quite feeble, were repeatedly felt by the vaginal touch. External examination of the abdomen revealed in the right iliac fossa a firmly adherent tumor, which fluctuated sensibly and contained a solid body that was somewhat movable. The tumor appeared to consist of a thick walled sac inclosing an irregular solid body surrounded by a liquid. The sounds of a fœtal heart could not be satisfactorily determined. The diagnosis of extra-uterine gestation was made.

Upon the 12th of November the fœtal movements were much more decided to the vaginal touch, and were also feebly felt in the right iliac fossa. On the 20th the tumor was notably lower in the true pelvis, and the fœtal movements were still more energetic. There was considerable œdema of the vulva. Micturition had become very difficult and the constipation obstinate, there was also much flatus in the bowels which she was wholly unable to expel. Her distress was extreme, and loudly called for relief from the pressure upon the pelvic organs. It was determined to operate as soon as practicable, and to remove the fœtus entire through the vaginal cul-de-sac. In deference to the desire of the patient for a little delay, the operation was set down for Saturday the 23d. Early upon the morning of the 22d, however, she was discovered to be in a state of decided collapse. Her vital powers were waning so rapidly that it appeared very doubtful if she could survive another night, and quite certain that on the following day she would not be in condition for any operative interference; she therefore gave consent that the operation should be done at once. Hasty preparations were accordingly made, and at 1 P. M. she was placed upon the table and etherized, Drs. G. W. Holmes, J. B. S. Holmes, and E. P. Lovelace assisting. The pulse was rapid and very feeble,

notwithstanding full doses of brandy and morphia given during the day, and the prospects for a rescue were far from encouraging.

Operation.—The patient being upon the left side, and semi-prone, the vagina was opened with Sims' speculum. A rather small trocar, curved to the arc of a circle of perhaps eight inches diameter, and provided with a reversible blade, spear and probe-pointed at the opposite extremities, after the model of Chassaignac, was thrust through the vaginal wall, just behind the uterus, penetrating the gestation sac. The blade of the trocar was now withdrawn from the canula and reversed, so as to throw the probe-point forward, and the instrument was advanced along the inner wall of the sac to a point just in front of the rectum. Again reversing the blade, the spear-pointed extremity was made to puncture the tissues, and to emerge into the vagina again. The canula now traversed the lower extremity of the gestation sac from the uterus to the rectum. A piece of wire attached to the écraseur chain was next passed through the canula from point to base, in such manner that, when the canula was withdrawn, the chain followed and replaced it in the tissues. The chain was now connected with the écraseur of Chassaignac, and the included tissues slowly crushed through, laying open fully the cavity of the sac, and giving free escape to the liquor amnii. This part of the operation was entirely bloodless. The foetus, presenting by the head, was seized with an ovariotomy forceps, and delivered alive, inflated the lungs, and survived a half hour. So great had the abdominal distension become that a large quantity of pultaceous feces escaped spontaneously upon the removal of the obstructing foetus. The cord was tied and left hanging from the vulva. But very moderate force was required to effect the delivery. The placenta was attached to the lower part of the gestation sac adjacent to the rectum, and its attachment was somewhat disturbed in the passage of the foetus, so that a very free hemorrhage followed immediately afterward. This was promptly checked by the introduction of a sponge saturated with perchloride of iron, and a firm tampon of cotton-wool was placed in the lower part of the sac and vagina in such manner as to bring to bear pressure upon the site of the placenta, and control the flow. The collapse of the patient was extreme; she became pulseless at the wrist, and gasped for breath. Brandy was used freely in the arm by many punctures of the hypodermic

syringe, and the head was dropped over the edge of the table, to carry the blood more freely to the brain. In half an hour she came around very fairly, and was put to bed.

During the afternoon and night she had three grains of morphia, with milk and brandy, both by the mouth and by enema, as freely as she could take it.

Second day. Morning, pulse 120, temperature 99.5° ; noon, pulse 112, temperature 100° ; night, pulse 120, temperature 102° . The skin was natural; tongue clean and moist; countenance pinched and anxious; slept fairly at intervals. The tampon, excepting the sponge, was removed in a very fetid state, with strong ammoniacal odor, and the vagina well syringed out with carbolic water. There was no bleeding.

Third day. Morning, pulse 120, temperature 101.8° . The urine was normal in appearance and in good quantity, and there was free alvine evacuation. She had slept well during the night. The countenance was cheerful; she took bread and milk and chicken-broth, and passed the day fairly well.

Fourth day. Has passed a good night. Pulse 136, temperature 103° ; urine natural, and in good quantity; tongue coated and rather dry. The sponge was removed, and fragments of putrescent placenta with the cord came away; the vaginal washings were brown and offensive. Quinine was given in full doses, and the pulse and temperature fell to 120 and 100° respectively.

Fifth day. Passed a restless and bad night. Pulse 120, temperature 98.5° ; skin dry, tongue very dry; countenance anxious and pinched; declines food, but is very thirsty; washings offensive; no hemorrhage; free alvine evacuation and bilious vomiting. At 6 P. M. the temperature was normal; pulse 120, small and feeble. At 7 P. M. there was no pulse at the wrist, the respiration was hurried and labored, with much jactitation. At 8 P. M. death occurred, the patient having been confined to bed just fourteen weeks.

Autopsy thirteen hours after death, by Dr. E. P. Lovelace.—Rigor mortis well marked. There is great emaciation and a jaundiced hue of the skin. Abdomen opened in the linea alba. No plastic lymph nor other sign of peritonitis. Very small amount of serum in the peritoneum. The uterus, enlarged as in six weeks' pregnancy, was found above the pubis and pushed over to the left of the median line. The left ovary presented nothing abnormal and contained no corpus luteum. The right ovary could

not be traced; it was lost in the gestation sac, which occupied the right side of the pelvis and was closely attached to the uterus. This sac was firmly bound down to the pelvis and united to the uterus and to the cæcum. The sac presented a dark brown hue indicating the existence of blood-clot within. When freely laid open, it was found to contain fibrinous clots and decomposing placenta.

The treatment of extra-uterine gestation is by no means governed, as yet, by any very fixed and well-defined rules. So great is the variation in the situation of the gestation sac, as well as in the morbid phenomena presented, and the hazard to maternal life involved, it is probable that much latitude must always be allowed for the exercise of sound discretion in the management of individual cases as they may present themselves. It is only by the accumulation of large numbers of recorded cases and careful comparison and analysis of them that we may hope to make progress toward a better defined system of rules.

In offering the foregoing brief history of this case it is designed simply to put it upon record. The writer does not propose it as an example for imitation in its management. Whilst his own judgment acquits him of remissness, upon the one hand, and of undue officiousness upon the other, in the circumstances which surrounded him, he is nevertheless aware that difference of opinion might properly be entertained of the judiciousness of the course pursued. It may not be unprofitable to examine briefly the treatment of the case and the reasons for it. And first let us inquire why was the policy of non-interference adopted upon the first of November and adhered to upon the twelfth? Why was not the sac punctured and the liquor amnii discharged per vaginam? It is answered, that the object of this proceeding is chiefly to prevent rupture of the sac by destroying the life of the foetus and putting a stop to its growth; that four months, or more, of gestation had elapsed and the chief danger of rupture of the sac had therefore already been passed; that vigorous efforts had previously been made to reduce a supposed retroversion, and it was inferred that no immediate danger of rupture could be impending or the accident would have occurred during these efforts; that the condition of the patient was not such as urgently to demand any active interference; that the gestation sac presented so favorably in the posterior vaginal cul-

de-sac as to be accessible at any time when it might become necessary to interfere, or when nature might lead the way ; and, more than this, that a practitioner of good general repute, after weighing the evidences of extra-uterine gestation, still adhered to his diagnosis of retroversion of the gravid uterus, and another of excellent standing was much in doubt.

Why was it determined to extract the foetus upon the twentieth? It is answered, that the case had then assumed so formidable shape that the mere evacuation of the waters did not promise relief; that the vital powers of the patient were rapidly waning; that the pressure upon the rectum had almost completely obstructed the passage of feces, and the intestines were becoming loaded to repletion. It was clearly the growing foetus, and not the sac of waters, which now constituted the barrier to the alvine discharge, and nothing short of the complete removal of the former could give adequate relief. The foetal head, too, had descended markedly in the pelvis, the intervening tissues were comparatively thin, and the sutures of the skull could be distinctly marked out by the vaginal touch. In a word nature was leading the way, to all appearances, and it but remained for the surgeon to follow in her footsteps.

The writer knows of no precedent for the use of the *écraseur* in opening the sac of an extra-uterine foetation. It seemed to offer some advantages, especially in the immunity from hemorrhage which it gives in the division of very vascular structures, and its crushing effect upon the tissues could not be objected to when it was so desirable to maintain a free opening for drainage. It certainly did its office most admirably in this instance, and would be used again, in similar circumstances, in preference to any other instrument, not excepting the galvano-caustic knife.

REPORT ON ELECTROLYSIS OF UTERINE FIBROIDS ACCORDING
TO THE METHOD OF DRS. GILMAN KIMBALL, OF LOWELL, AND
EPHRAIM CUTTER, OF BOSTON, TO DATE OF APRIL 1, 1879.

BY EPHRAIM CUTTER,
BOSTON, MASSACHUSETTS.

Prelude.—In the summer of 1871 the writer exhibited to the Middlesex East District Medical Society (Massachusetts) a large quantity Stohrer battery. Water was decomposed, beefsteak coagulated, and a platinum wire heated. A day or two afterward Dr. W. S. Brown, of Stoneham, Massachusetts, applied to the writer to yield to the request of Mrs. Robert Pierce, of Melrose, Massachusetts, who desired to have electricity brought into contact with a large central intestinal uterine fibroid, that caused severe hemorrhages, etc. It appeared that her husband served under General Kilpatrick during the war of 1861, and that the latter, having been cured in half an hour of an erectile tumor in his neck, had advised the use of the same remedy for Mrs. Pierce.

It was objected that the cured tumor was angiomatous, and the fibroid non-vascular. Moreover, on taking counsel of Boston electricians, it was found that the procedure would be regarded as an unsuitable one in every respect. Still the facts that it had never been tried, that the way was so clear, and that the disease was hopeless of cure as things were at that time, added to the importunity of those interested, made me yield to the invitation, and on August 21, 1871,¹ an application of the galvanic current was applied by the writer in the presence of several medical gentlemen. Two insulated needles were thrust into the growth per vaginam to the depth of an inch, and the circuit completed. Eight days later Dr. Kimball was present and applied the needles. The results of these essays were not satisfactory. Dr. Kimball entered into the project with remark-

¹ Philadelphia Medical and Surgical Reporter, Feb. 8, 1873.

able earnestness and vigor, and to the force of his character is mainly due the history that has been made. Feeling that the needles we had were imperfect, a perfect set was procured through the kind intervention of Dr. R. P. Lincoln, the successful operator in General Kilpatrick's case at New York City. These were tried on the second case, a Mrs. Ferris, of Springfield, Massachusetts, now of Newton, 40 years old. Tumor pelvic; fibro-myoma; size large. Imperfect applications from the twisting and bending of the needles. Two applications, both without anæsthesia. Collapse imminent; impression profound.

Result.—Tumor arrested in development. Return of appetite and strength. Health much improved as late as 1876. Since then not heard from.

Owing to the difficult introduction of the needles Dr. Kimball said he would have no more to do with the operation unless better electrodes were invented. This stimulated the writer to produce a needle—called now by his name—which has answered every demand made in the treatment of about sixty cases.

Those who are interested can find a condensed abstract of fifty cases published in the *American Journal of the Medical Sciences* for July, 1878. The results were:—

I. Not arrested	.	.	.	.	.	.	.	7
II. Deaths	.	.	.	.	.	.	.	4
III. Arrests	.	.	.	.	.	.	.	32
IV. Relieved	.	.	.	.	.	.	.	3
V. Cured	.	.	.	.	.	.	.	4
								50

The design in the first place was to see if the growths might not be arrested. It was not thought possible to do anything more. The operation is intended for extra-mural fibroids. It is a severe one, and requires the relegation of the patient to bed and a nurse. The electrodes are thrust through the abdominal walls, the vagina and rectum (preferably). One to nineteen operations have been performed on one case alone. Interval between operations two days to several months. Impression on tumor has been felt in one day and in the course of two years afterwards. In nine cases severe peritonitis has followed—generally, however, there has been a remarkable absence of inflammatory action. It has seemed as if the galvanism had acted as a protector in this respect. The cases have been selected from the class where the tumors were on the increase, causing pain,

general malaise, and where the patient was evidently growing worse.

It was intended that, if the results were of a negative character, there should be no doubt as to the thoroughness of the application. The time consumed in passing the current has varied from three to fifteen minutes. Ten minutes is long enough in our opinion. Signs of profound collapse follow too long an application. These are systemic and objective. The operator needs to watch the circulation in the arteries, veins, and capillaries. By removing the plates from the fluid and then submerging them, a corresponding effect is usually impressed on the rate of the pulse. Kind of battery, carbon and zinc, eight pairs, 6 inches by 9 inches, arranged by the writer so as to resist breakage and have as few parts as possible.

REPORT.

The first important matter in relation to this operation is its complete vindication from the dicta of certain experts, who have declared that the results obtained have been due to *puncture alone* and *not* to passage of a current.

According to the previous state of knowledge the human body has been deemed a bad conductor, hence the low intensity of the immense quantity, said these critics, was not enough to overcome the resistance of the human body. This position one critic maintained by publishing the account of an experiment with a like battery and a piece of beef. The galvanometer intercalated did not respond. Hence an announcement that Cutter had no current. Since then Dr. David Prince read a paper before the Illinois State Medical Society, May 28, 1878, on Sprague's galvanometer. In this paper he alluded to the above experiment and the deduction therefrom, and stated that he had repeated the experiment with this galvanometer and found that the needle was deflected. Dr. Prince infers that I was right, and my critic wrong, and that the defect was in the *poor character of the galvanometer used*.

But another gentleman and his son have explored this field fully. Dr. Alfred C. Garratt, a veteran electro-therapeutist of this city, stated at a meeting of the Gynæcological Society of Boston, held in 1878, that he and his son had spent much time and procured new instruments, and that he had settled the question,

proving beyond a doubt that there was a current—by the deflection of a needle, the decomposition of iodide of potassium in the presence of starch, etc. At a subsequent meeting of the Gynecological Society of Boston, held June 13, 1878, Dr. Garratt tested the Cutter battery, passing the current through four inches of beef just taken from a refrigerator. Intercalating a galvanometer the current deflected the needle 90° and held it there; the rheostat showed a resistance tremble; albumen was coagulated; a black cloud grew in the white iodized starch; muscles were made to twitch: these phenomena were seen by the members of the society, all of whom can testify as to the correctness of this relation. Dr. Garratt further stated that the experiments of the operation confirmed by his own experiments showed that the human body tissues were a fourfold better conductor than water. Dr. Garratt's paper was published in the *Southern Clinic*, of Richmond, Virginia, for January, 1879.

In order to clinch more fully the matter and satisfy the hypercritics, Dr. Garratt kindly consented to test the current on an actual case when the current was passed through the fibroid in the living person. The patient's name was Monighan, 171 Winsor Street, Cambridge, Massachusetts. On November 16, 1878, in the presence of Dr. H. O. Marcy, of Cambridge, the attendant physician, Drs. Wm. G. Wheeler and Weeks, of Chelsea, Massachusetts, Drs. A. L. Norris and Mæder of Cambridge, Dr. L. F. Warner, of Boston, Dr. Bartlett, of Woburn, most of them permanent members of the American Medical Association, one electrode was introduced into the tumor through the rectum and the other electrode through the abdominal walls. The current was passed for four minutes, and the patient showed signs of flagging. The plates were removed from the fluid, and Dr. Garratt intercalated his galvanometer. The current was then started through the fibroid, and the galvanometer needle instantly swung around and held at 170° . The experiment was repeated, until the passage of a current was demonstrated and verified beyond every doubt.

Subsequently, a report of this case was made to the Suffolk District Medical Society, and Dr. Garratt and Dr. Weeks both arose and testified to the truth of the statement. The battery was introduced. The electrodes were plunged into a mass of beef, at least four inches asunder; the galvanometer was intercalated; the president, Dr. C. D. Homans, took a position where he could

see the needle; a completion of the circuit was made; instantly the galvanometer needle was deflected with so much energy that it spun around in a circle. This the president was satisfied of. Other gentlemen came up and witnessed the same thing repeated, so that now, whatever else may be averred of this operation, no one can say there is no current, and the question, as Dr. George M. Beard, our most distinguished electrologist, says, is a "*closed one*." Having thus vindicated the operation before its critics, it remains to point out a few new phases that are of interest, which the experience of the past year has added to history.

Second. We have learned that it is dangerous to operate on a person suffering with albuminuria.

In the case alluded to, when the test current was passed, it was ascertained after the operation, by the thorough-going and earnest attendant, Dr. H. O. Marcy, secretary of the Section of Obstetrics, American Medical Association, for the year 1878, that the urine was albuminous. This has been a source of some annoyance to me, as I ought to have detected this condition myself. In justice, however, I may say that in the past cases we have not thought it necessary to test for albuminuria, and, besides, Dr. Marcy said she was in a suitable condition, and, trusting to his superior judgment and better acquaintance, she was etherized before I saw her the second time in order to save the time of the physician. "Mrs. M. died in fifteen days after the operation, in part from exhaustion. She had diseased kidneys, as I learned by examination albumen, and casts." (Postal of Dr. Marcy.) "Show me a man who makes no mistakes, and I will show you a man who has done nothing." (Liebig.) It is the intention of the reporter to tell the truth, however unpleasant; and the lesson taught by this death is to avoid the operation in cases of diseased kidneys, unless it is a *dernier ressort* and a last chance. It certainly was so with Mrs. M.

Third fact. *The extrusion of the fibroid from the vagina fifty-three days after the application.* In this case, a spinster, an invalid for nine years, bedridden the last four years, presented an interstitial, mono-lobed, mobile fibroid, of four years' standing at least. Bimanual examination revealed a mass judged to be seven inches in diameter; dense, not stony. One electrode was introduced through the abdominal walls to the depth of four and a half inches. The other electrode was introduced through the rec-

tum into the growth. Current passed for ten minutes. Battery used was the Cutter Battery No. 2 (more portable than Battery No. 1).

Dr. William Lester, of South Hadley, Massachusetts, her family physician, wrote that on January 15, 1879, fifty-three days after the application, in his necessary absence, Dr. Franklin Bonney, of Hadley, Massachusetts, was called in on account of pain, distress, and a feeling that something was about to pass per vaginam. On examination Dr. Bonney found a portion of the tumor partially engaged in the vulva. This he readily removed. It proved to be the fibroid.

On February 5th the writer visited the patient, and, after a careful examination in connection with Dr. Israel N. Taylor, of Amherst, Massachusetts, and the above-named gentleman, said, that, "if I was called to see this case for the first time, I should say that there was no case for operation."

Remarks.—This is a new feature in the history of the operation. It is curious to see how each case develops its peculiar phases. It was unexpected and gratifying. Our associate, Dr. Byford, of Chicago, says he has met with the same result in the ergotine treatment. We can easily understand why this should be so after the use of the drug; but how it should be accomplished by a ten minutes' application of a constant current of galvanism so mild as to be imperceptible to the tongue when touched to the poles or needles, we confess our inability to explain. We give the history and its witnesses. The interpretation of facts must always follow their relation. Still I may say that, could we secure such results in all the cases, uterine fibroids would cease to be a reproach to the profession.

Fourth. A like case to the last was operated on at Boston, December 18, 1878. A small nodulated, mobile fibro-myoid, attached at the fundus of the uterus and incorporated with it. Anterior portion of the uterus six inches in diameter; ante-flexion and anteversion; os uteri ulcerated and pushed against the rectum; operation advised in order to arrest the hemorrhage. Present, Professor H. M. Field, of Dartmouth Medical College; Drs. E. A. Perkins; Blodgett and Harriman, dentists, of Boston. Seven minutes' current.

February 7, 1879. No tumor can be felt over the pubis. Per vaginam, os uteri healed; central in vagina. Ante-flexion and anteversion hardly perceptible. During this time the history

had been such that I regretted having operated. The protean phases of a disturbed nervous system were severe, changing and annoying, if not absolutely alarming. There was all along a somewhat profuse, thin, and watery vaginal discharge. Still, in view of the great physical improvement found on exploration, the diminution of the tumor, the restoration of the uterus to its normal site, and the reduction of the flexion all in fifty days, it seems as if this was a matter for encouragement. Certainly the results were positive, and, in the light of the associated cases, attributable to the galvanic interference.

Fifth. In one of Dr. Kimball's late cases he says that he applied one electrode through the vagina, and then completed the circuit by a sponge electrode over the pubis. The results that followed this application were so alarming as to convince him that this procedure was not so satisfactory or safe as that which the writer laid down at first.

It was at the outset thought best to confine the action of the current to the tumor alone, and not to apply it to the neighboring tissues. One reason was that we might be sure the current was accurately and thoroughly applied to the morbid growth. Another reason was that it was unnecessary to disturb the neighboring normal tissues, which were not at fault. This is the principle of topical treatment of throat affections. A third reason was that the tumor alone is the substance at fault, and needs the benefit of the whole force of the current. By complete insulation of the needle in the healthy tissues it was proposed to effect these designs. So far the experience of the writer has confirmed this position, and my associate joins with me, backed by the fearful experience of this case.

Remarks.—Certain persons have suggested to me some variations in our procedures in these cases. Their suggestions have been respectfully entertained; but no alteration has been made except when the writer was firmly convinced in his own mind as to its advisability. For instance, one gentleman said that I ought to operate on a case without any current whatever, because he knew I had no current. The reply was that I was not convinced of the truth of his position, and my conscience would not allow me to depart from my carefully digested and concerted plan simply to gratify him. It seemed to me, that, if he believed it advisable to operate by puncture alone, it was his

duty to do so at the first opportunity. He declined, and I have not heard of his operating.

The number of cases now operated on by Dr. Kimball and myself reaches sixty-one. It is proposed to reserve their publication for a future report. The progress is slow. However, the operation is not given up at all. It is intended to pursue it further, so that future experience combined with the past may determine its true value. Meantime, those who feel like aiding the cause along are invited to co-operate as far as their common sense and desire to advance our knowledge will allow.

MY STEM PESSARY.

By EPHRAIM CUTTER.

BOSTON, MASS.

NOTE.—For the sake of brevity and distinctness the personal pronoun is used.

THE etymology of the term Pessary has been referred to Prof. Jacob Cooper, D.D., M.D., of New Brunswick, N. J. He states that the common term used among the Greeks to designate the penis was “*peos*.” So that *pessos* is equivalent to *peos* = penis, and *eis* = into—leaving the cavity to be inferred. Hence *pessos* or pessary had the peculiar signification of a substance to be applied within the vagina.

As to the question whether the pessary of the ancients entered the uterus and was used like the modern stem pessary he writes:—

“1. There is no doubt that ‘into’ in the Greek Lexicon is rightly used. But whether the *πессός* was inserted wholly within the uterus, so that no part of it was protruding, *cannot* be determined from any of the passages where the word is used: *e. g.*, Paulus Æginetus 7.24, 3.61; Dioscorides 1.14³, 2.66, 1.87; Theophrastus, *Historia Plantarum*, 9.20.4; Rufus pg. 105, 237; Oribasius p. 322, etc. My opinion, from a careful examination of the subject, from all the light I can get, is that the pessary was intra-uterine. Liddell and Scott say, ‘into the vagina, anus, etc.’ (6th edition, Oxford, 1869), as it was intended to be used and worn for a time.

“2. The *πессός* was not employed to keep the uterus in its proper place as the purpose now is, but to apply medicine; *e. g.*, Paulus Ægineta says: ‘*πессόν ἔριον, διεξ-σμενον και σφαιρωθέν, δακτύλου σχῆμα εἰληφώς, εν ᾧ εγχατεχεται τὰ φάρμακα.*’ The pessary was made of wool, made smooth, *e. g.*, by carding, and spherical, taking the shape of a finger, in which were contained the medicines.

“Dioscorides 1.143, ‘ἐν πεσσοῖς λῆλον (βονπρησειδα) προστιθεται φοῖκαις γυναιξί.’ In the pessaries is placed (the herb) bonprestes, ground fine, for menstrual women.

“So again Dioscorides 2.66, ‘αγῶσι (that is the herb bonprestes) και εμμηνα πεσσοις μαλακτοχῶο γιγνεται.’ These (herbs) when mixed with emollient pessaries bring on the menses.

“Pessaries were sometimes made of lint, of gums, or of resins, but in all cases as a receptacle for medicines to be applied through the vagina to the womb, or through the anus for diseases of the fundament; in no case, as far as I can find, for the proper modern use of this instrument.

JACOB COOPER.”

It is probable then that the idea of using a stem pessary for the purpose of rectifying uterine versions, flexions, and prolapsus, for elevating the ovary, and for correcting malpositions of the vagina, belongs to our own time. Moreover, the combination in the arrangement, form, and use of the particular and peculiar stem pessary that is the subject of this paper is new. I feel justified then in presenting this contribution to the gynæcology of the moderns. My own estimate must stand the test of time. My duty ends with the presentation.

As the concrete is more palpable than the abstract, the history of the use of this stem pessary in three cases is given as typical.

CASE I. No favorable result. About 1868 Mrs. A., residing on W. Springfield Street, Boston, suffered from anteversion of the uterus. Her nervous system was so much disturbed as to make life a burden. She was of good size, symmetrical, middle-aged, married, with two children. The disease was of long standing. The uterus was enlarged and sensitive. The anteversion loop pessary of the writer was used without success. She could not tolerate it. Various means were resorted to in order to allay the irritable condition of the womb. Local depletion by leeches seemed the most successful. After much deliberation and preparation my stem pessary was applied. At first it promised well, gave no trouble, and was better borne than the extra-uterine one had been. But after a week or two it began to irritate and occasion pain and distress. The patient was not put to bed (she should have been), but was carefully watched. One day the uterus was found bent over the end of the stem. It was righted. Another day the uterus was found to have swallowed the disk (!) so that it was inside the organ and the point of the stem push-

ing it to the fundus. The pessary was removed at once and the treatment abandoned. The patient recovered her former condition with no lasting ill effects. Still the stem was a failure.

Remarks.—The uterus was enlarged, and consequently the cavity was much larger than the stem. Hence the history. This was in the early days of the use of this instrument. I ought not to have tried to fit any pessary whatever until by diet, depletion, iodine, iodoform, glycerine, etc., the hypertrophy should have been first removed. Or, if the hypertrophy should have been obstinate, and the hyperæsthesia had been removed, then a stem exactly one-fourth of an inch shorter than the depth of the uterine cavity might with the greatest caution have been tried. The ordinary length of the stem is two and a quarter inches. But it may vary from this dimension. Case I. is typical of the class where no pessary can be used. Some regard this class as including *all* uterine versions and flexions. But history shows such a sweeping relegation to be incorrect. Patients otherwise unrelieved have been relieved by the instrument in question.

CASE II. Partial success. Old anteflexion; great hyperæsthesia; tolerating stem pessary where the extra-uterine pessary was not tolerated. Miss N. B., Cambridge, Massachusetts, 34 years of age, school teacher, disabled and laid up for several years. Marked symptoms were pain on pressure over the spinous process of the middle dorsal vertebra, and a tract of hyperæsthesia over lower third front and back right chest. Vaginismus; abdomen tender to touch; no tumor; great suffering; loss of sleep, of locomotion, and of participation in the active duties of life. Still her general physique was fine. Countenance rosy; manner subdued. She was subject to facial and ocular erysipelas. Bowels constipated; dysmenorrhœa; no abnormal vaginal discharge; chest signs normal. Indeed, an over sensitive, enlarged, anteverted and anteflexed uterus seemed to the writer to be a sufficient cause for the symptoms, especially as the uterine disease had been entirely ignored and the case called rheumatic and hepatic.

At first local depletion by leeches relieved all the symptoms. This was followed by iodoform suppositories and my antever-sion loop pessary. These produced so much benefit, that in place of being an invalid she became a housekeeper in another State. This was unwise. As often happens, she overworked

and suffered a relapse. After being sick for months she returned home a renewedly confirmed invalid and reapplied for treatment. After much deliberation it was decided to use my stem pessary, for the reasons that the loop pessary did not fully realize the indications, and she thought it irritated. It was applied easily, and restored the uterus to its normal site. She was put to bed and remained there. At first she bore the pessary well. Soon there was some irritative fever with tender abdomen. Opium by the mouth, and infusion of veratrum viride, f3j to Oj water, to outside of abdomen, relieved the inflammatory symptoms. She tolerated the instrument, and wore it for several months, ambulating about the house, and asserting that her chief troubles were relieved. She was not seen very often, as the stem pessary kept in place without trouble. This is usually the case. In about six months she removed the instrument herself, asserting that she now felt well enough to go without it, and promising to be very careful in future. She is not well; perhaps never will be. Still the stem pessary was an essential part of the interference which was followed by relief. It seems hypercritical to attribute no benefit to the stem pessary.

Remarks.—This patient under the non-interference plan grew progressively worse. Her case illustrates the following important principles in the use of the stem pessary:—

1. The patient must go to bed.
2. Hypertrophy and inflammatory results must be removed before using the stem pessary.
3. *Mensuration.* She was measured for the pessary with the uterine sound. The distance from the os uteri to the perineum plus one-half inch gives the proper length of a stem pessary from the disk to the hoop.
4. Pessaries may partially relieve if they do not cure.
5. It is a serious matter to use any intra-uterine pessary. This my patient fully understood and acted on, else this, her story, would not have existed.
6. The intelligence and good judgment which she manifested were great aids to treatment. This may be understood when it is stated that subjective errors and mistakes of the patient often are a serious bar to intra-uterine treatment. If the patient will not keep still and be controlled, it is risky and worse than useless to attempt restoration.

CASE III. Typical of the cured cases. Mrs. P. W., Wakefield, Mass., early in 1877 had anteflexion. She was almost insane from the consequent disturbance of her nervous system, and her friends thought of remanding her to an asylum. She was 30 years old, under-sized in stature, been married for several years, had one child. Complained of inability to walk; pain in back and limbs; frequent micturition; leucorrhœa, dysmenorrhœa; the uterus was sensitive to the touch; lowered in the pelvis; not enlarged. At first, my anteversion pessary was used with benefit. She was able to walk about once more without difficulty, and, as it often happens in such cases, exerted herself too much. The over-sensitive condition returned, and finally she could not tolerate this extra-uterine support. Moreover, it was impossible to give her by this means a relief that did not get out of order and become annoying.

After deliberation and mutual consultation and understanding, it was decided to try my stem pessary, as it would restore things to normal relations better than any other means I knew of. If tolerated, it was not liable to become displaced, nor would she need attendance oftener than once in two or three months, and she could remove it at will, should it at any time become intolerable. It would be less of a monetary matter also.

The uterine cavity was measured, and found normal. The distance from the os uteri to the posterior fourchette was ascertained to be three inches. A pessary, with a stem two and a quarter inches long, and one-half inch longer than the above-named distance, was applied with facility—the patient being undressed and in bed. This was in June, 1877. Save what was due to the wearing out of the belt and cord, no trouble has ensued. On the contrary, she has gained flesh, strength, and mental force, engaging actively in the pursuits of a New England housewife, and is called *cured*. The pessary was removed March 14, 1879, and she has returned to her marriage relations for several seasons. She is willing to appear before a medical society, in order to testify in person, in the hope that others may receive a like benefit.

Remarks.—This person also tolerated an intra-uterine stem pessary, when she could not bear an extra-uterine anteversion loop. Her intelligent and active co-operation was a great element of success. Says that ordinarily she should not know by her feelings that she was wearing the pessary.

My eminent and respected friends, masters in gynæcology, are not thus sustained in their public utterances stating that no stem pessary can be worn by any woman (meeting American Gynæcological Society, 1877). They must rather say that, in accord with their experience with stem pessaries (other than mine), they cannot be tolerated.

Far is it from me to set my teachers at defiance. I accord them due respect as my superiors. Still, a private from picket duty may report—indeed, it is his *duty* to report—facts that are a part of his professional history, no matter what their bearing may have on the dicta of his superiors. So I think I may properly report what I know about the use of an instrument of my own invention, which is new and untried by the leaders of the rank and file of the great army of medicine.

“A capacity to do good not only gives a title to it, but renders the doing of it a duty,” said William the Conqueror to the Duke of Brandenburg. Ram (On Facts) says, “Society always respects actions based on intense convictions of duty.” I hope, then, that I may not be misunderstood in saying that I am thoroughly convinced that this stem pessary has done good, and that, saying this, I mean no disrespect to my superiors who have pronounced so positively against its use. History in general shows that unqualified assertions of impossibility are hazardous. The great Dr. Lardner declared positively, and proved on paper, that steam ocean navigation was impossible. Yet we read that, while he was yet speaking, a steamer was crossing the Atlantic, and they have done so ever since.

Facts are greater than opinions and dicta. If I feel assured that my stem pessary is the most theoretically perfect and effective uterine support which it has been my privilege to contribute to gynæcology (save the fact of its being intra-uterine), the summary relegation of it to the realms of impossibility of use by men who have had no experience with it, rather rouses me to defend the rights my medical alma maters conferred on me. (“*Omnia jura, privilegia*,” etc.) I respectfully re-submit the following statement of the principles of the treatment of uterine versions and flexions.

1st Principle. In all cases there is a derangement of the normal axes of the vagina. The long normal axis *usually* becomes the short abnormal axis, and the short normal (transverse) diameter becomes the long abnormal axis. This happens because the

transverse diameter becomes distended by the dislocation of the uterus itself.

2d Principle. The great end of cure must be to restore the normal condition of these axes—to wit, to make the abnormal short diameter the long axis, and the abnormal long axis the short axis, or transverse diameter of the vagina.

3d Principle. That the vagina is *for treatment* the most important uterine support that our art can affect. This appears so to me by the fact that when the vagina presents its axial relations normal, uterine displacement is improbable and almost impossible. Moreover, the broad and other ligaments of the uterus we cannot reach, though I have sometimes wished it were justifiable to cut down and surgically restore the abnormal round ligaments. So that the normal vagina and uterine displacement are not correlative. This is doubted. Still I note that in the operation for ruptured perineum stress is laid on the importance of having a good perineal support for the vagina. I fail to see its importance if the vagina has nothing to do with the uterine support. Besides, in the use of the common intra-vaginal pessaries, we are told that the ring pessary, for example, is held by the resistance of the transverse vaginal fibres—that the vagina is the fulcrum, etc. These statements I submit include the idea of vaginal support. But this is not a polemic paper.

4th Principle. The indications of treatment are—

- (A) Extension of long vaginal axis to normal limit.
- (B) Contraction (tonic) of transverse diameter to normal limit.
- (C) Restoration of uterus to normal axis, to have it mobile, springy—supported before, above, and behind by the pelvic viscera, as it were cushioned all round.

(D) Precession of proper differential diagnosis, exclusion of sources of error, surety that we have nothing but a flexion or version to deal with.¹

(E) Restoration of normal uterine condition before attempting support; also, to put patient's general system in good trim by diet.² It is a rule with me never to use any pessary on a sensitive womb.

(F) Having thus prepared the way, the next thing is to replace the uterus with a sound. I have often thought, that, if it were possible for one to hold the uterus in place with a sound, then

¹ See Thomas's Diseases of Women—a systematic work for diagnosis.

² See N. Y. Journal of Obstetrics, Nov. 1877—(Food as a Medicine, etc.).

we should have the best uterine support (save the intra-uterine relation), because the normal position is restored, the long vaginal axis is restored, and the transverse vaginal diameter is distended with the least possible material; thus the vagina has an opportunity to contract down to its normal size, which is indication of, to wit—

(G) *Minimum lateral distension of vagina.*

As a mechanical topographical human body engineer (so to speak), I see in this restoration of the normal axial relations of the flexed and vestal uterus and abnormal vagina to the other pelvic viscera as complete a carrying out of the laws of correlation and collocation of the healthy organs as it is possible for man's ingenuity to devise. This being my conviction, the next step is to suggest how to maintain this uterine sound replacement by some contrivance that will accomplish the same thing in the absence of the physician. The device for this purpose I call my stem pessary. It may not be the best thing, but it is the best contribution I can make for the solution of this difficult, delicate physical problem. It differs from other stem pessaries that I have seen in its posterior single rubber support common to all my pessaries. This consists of a belt to go around the waist (it may go over the shoulders). Where it crosses the spine an India-rubber tube, one-fourth of an inch in diameter (of first-class quality), hangs. This replaces the natural normal vaginal elastic support. It lies in the natal furrow, clears the perineum at half an inch distance, and is fastened to the pessary proper, which is made up of the cylinder, disk, and stem. The cylinder is about the size of a penholder, and is curved into a hoop, which compasses the perineum, following the central long axis of the vagina, and is continuous with the stem portion, which stands at an acute angle forwards with the vaginal cylinder. Both are made in one piece. The stem tapers, and should be one-fourth of an inch shorter than the uterine cavity. At the junction of the stem and cylinder is a short peg projecting backwards from the angle. This engages the disk, which is movable on the cylinder, and on which the cervix rests, so that the point of uterine support does not come on the end of the stem; so that mobility is allowed; so that flexions are straightened out as in a splint. The disk being made of the same diameter as the cervix, it does not distend the vagina laterally. There is also a cul-de-sac before and behind the neck. As long as the suspensory tube maintains its integrity and tension,

the stem pessary holds the uterus in place. At the middle of the hoop is a transverse joint I added at the suggestion of Dr. H. R. Storer, President of the Gynæcological Society of Boston. This is for the purpose of turning the hoop away during defecation.

Thus, to my mind, at least, this stem pessary fulfils the conditions of relocation by means of the uterine sound held in the gynæcologist's hand. In this supposition experience bears me out. This stem pessary has maintained the normality of the uterine and vaginal axes. It has extended the vagina by raising up the uterus and supporting it. It has distended the vagina only one-fourth of an inch. It has straightened out flexions. It has furnished an elastic support to the uterus which allowed of mobility. It has come in contact with the uterus for a bearing only on the end of the cervix; the stem takes no bearing on the fundus. Its inside contact is only lateral. A side movement brings the whole length of the stem against the uterine walls, so that the resistance is distributed over the largest possible surface, the breadth of which allows of no special impinging on one point. It is like a splint in a case of fracture, only a splint is usually outside while this is inside! It is the only means I know of surely straightening out a bent uterus, and the simplest way to treat a flexed womb is, in my opinion, by straightening it out. It is simple, philosophical, reasonable, effective. It has been worn for four consecutive years by a dressmaker all the while employed about the active duties of her profession. It is under the patient's control; she can remove it at any time; I have one patient who can replace it herself alone. It rarely gets out of order or deranged if the patient notes the proper tension and maintains it. My patients wear it for months without my being obliged to see them. Indeed this self-care after once being properly applied, is to me a great recommendation. The great objection is not ignored or concealed, to wit: it is *intra-uterine*, liable to produce irritation and inflammation, and according to the American Gynæcological Society, Boston, 1877, will (not my pessary, but the ordinary stem pessaries) produce death in one per cent. of the cases in which it is used,—not considered much of a risk for ovariectomy, amputation, cross-birth operations, or typhoid fever cases! While, then, it is possible to err on the side of boldness, I think it is possible to err on the side of timidity. The question

for the honest, careful, skilful practitioner is "Am I justified in interfering and taking the risk, or in letting my patient languish?" After mature deliberation and consultation, all parties understanding and assenting, I can see no good reason why a man is not justified in giving his patient a chance of recovery, and running the chance of one death in one hundred. As yet, that death has not occurred in my practice. It may.

Dr. J. F. Pratt, of Chelsea, Massachusetts, reports two women restored to health by the use of my stem pessary. Both were bedridden. One wore the instrument for eighteen months, the other wore it for two years at my advice. Both recovered, and now they are performing the duties and enjoying the pleasures of life.

In cases of prolapsed ovaries that have become chronic, I know of no other means of elevating the uterus and keeping up the ovary. Some years ago Dr. Bixby called my attention to such a case. The longest stem pessary I ever used was employed. She wore it sixteen months, when I examined the patient. A strong light was thrown on to the os uteri. It presented a slight dilatation, but no discoloration or loss of continuity, no induration, no thickening of the cervix, after a year and four months of distension and elevation on the disk of a four-inch stem pessary. She has now worn it nearly four years. Dr. Hanscome, of East Somerville, Massachusetts, her brother, says that it is well borne, though the patient is by no means well.

In conclusion, I am sorry to say that I have no control over my own instruments. Makers fashion anything they please and call it mine. I have no recourse; so that I have to bear the onus of any failures caused by imperfect instruments. I wish it could have been allowable to protect the profession and myself from imposition. It seems to me that the general sentiment of the profession in relation to the rights of inventors needs a revision and toning up.

Postscript.—1. This stem pessary may be worn or not during menstruation. 2. It should always be one-fourth inch shorter than the uterine cavity. 3. The size of disk may be learned by the use of my vaginometer, which gives the exact diameter of the cervix. 4. This stem pessary may precede the use of other pessaries, anteversion or retroversion. 5. When the uterus rises,

as it generally does, the hook impinges against the perineum; then a longer pessary is indicated. 6. Menstruation is easy, as the fluid can pass along the stem as a guide. 7. As the writer does not claim for *this instrument* the perfection of the principles on which it is based, any suggestions or ideas of modification will be courteously received. The limitations of human abilities require that many minds should combine to produce general results. Gentlemen, any criticism is courted. Provided that all efforts are united towards the advance of treatment—let alone individuals—no harm should result from flooding the subject with light from any quarter. Whether I have succeeded or not, I have tried to pay back the debt of gratitude I owe to those who have preceded me.

MINUTES OF THE SECTION

ON

STATE MEDICINE AND PUBLIC HYGIENE.

MINUTES OF THE BOARD

OF THE DISTRICT OF COLUMBIA

MINUTES OF THE SECTION

ON

STATE MEDICINE AND PUBLIC HYGIENE.

TUESDAY, May 6.

THE Section was called to order at 3 o'clock P. M. by Dr. J. T. REEVE, of Wisconsin, Secretary.

The Chairman of the Section, Dr. J. S. BILLINGS, U. S. A., being absent, owing to temporary illness, the Section proceeded to elect a Chairman *pro tem.*, and, on motion of Dr. E. L. GRIFFIN, J. L. CABELL, M.D., of Virginia, was unanimously elected.

Dr. A. N. BELL, of New York, announced that, by vote of the Association previously taken, the Section on Medical Jurisprudence, Chemistry, and Psychology, and that of State Medicine and Public Hygiene had been consolidated into one Section, to be known as Section IV. of the American Medical Association, and as The Section of State Medicine and Public Hygiene.

Dr. BELL further announced the death of the former Chairman of the Section of Medical Jurisprudence, Chemistry, and Psychology, Dr. Wm. M. COMPTON, of Mississippi, who had fallen a victim to yellow fever during the epidemic of 1878. Brief but eloquent tributes of respect to the character and memory of Dr. COMPTON were paid by Drs. EUGENE GRISSOM, of North Carolina, and FOSTER PRATT, of Michigan, and, on motion, the Chair was requested to appoint a committee, consisting of three members, to prepare suitable resolutions to be presented to the Section at a future time. Drs. E. GRISSOM, F. PRATT, and J. M. TONER were appointed such committee.

Dr. H. A. JOHNSON, of Illinois, then read a paper on *The Regulation of Medical Practice by State Boards of Health as exemplified in Illinois.*

On motion of Dr. E. M. WIGHT, of Tennessee, the paper was

received, and the thanks of the Section were tendered to the writer.

Dr. WIGHT inquired if the certificates of the Illinois Board had been recognized in other States, to which Dr. RAUCH answered that they had, both professionally and legally.

The subject of Regulating Medical Practice generally was then discussed in connection with the paper, Drs. J. H. RAUCH, of Illinois, A. L. GIBON, U. S. N., H. W. BROWN, of Texas, H. A. JOHNSON, of Illinois, and J. F. HIBBERD, of Indiana, taking part in the discussion, after which, on motion of Dr. A. N. BELL, the essay was referred to the Committee of Publication.

Dr. S. E. CHAILLÉ, of Louisiana, then read a paper on *State Medical Societies and State Medicine*, which, on motion, was referred to the Committee of Publication," and a vote of thanks tendered to its author. In view of the importance of the essay it was voted "that the paper be recommended for reading before the Association in general session."

Dr. E. SEGUIN, of New York, made a verbal report entitled *Psycho-Physiological Hand*, and, on motion, Dr. SEGUIN was requested to commit his report to writing and present it to the Committee of Publication; after which the Section adjourned.

WEDNESDAY, May 7.

The Section met at 3 o'clock P. M.

Dr. BILLINGS being still unable to attend, on motion, Dr. J. L. CABELL was again called to the chair *pro tem*.

Dr. E. GRISSOM, Chairman of the Committee appointed to draft resolutions expressive of the sense of the Section on the death of Dr. COMPTON, made the following report, accompanying it with some eloquent remarks concerning the character of Dr. COMPTON.

Whereas, Dr. WM. McCORKLE COMPTON, of Holly Springs, Miss., a distinguished practitioner of medicine, late the Medical Superintendent of the Asylum for the Insane in his State, a permanent member of the American Medical Association, and President of the Section of Psychology and Medical Jurisprudence, has been removed by death from the scene of his labors and usefulness, it is by this Section unanimously

Resolved, That we deeply deplore the untimely death from yellow fever of our distinguished co-laborer in medical and psychological science, and the official head of the above-named Section.

Resolved, That we heartily tender to his orphan children and

bereaved friends our sincere sympathy in their sorrow, and that we mourn with the people of Mississippi their loss of an intelligent, scientific, self-denying, and useful citizen.

Resolved, That these resolutions be reported to the American Medical Association with the request that they be referred to its Committee on Necrology.

EUGENE GRISSOM,
FOSTER PRATT,
J. M. TONER.

Dr. KELLER, in moving the adoption of the report, further eulogized the character of Dr. COMPTON, after which the report was unanimously adopted.

A paper prepared by Dr. H. R. STORER, of Massachusetts, on *The New Principles of Protective (private) Sanitation in its Relations to Public Hygiene* was read by Dr. DUNSTER in the absence of its author, and, on motion, was referred to the Committee of Publication.

The Section then took up the address of Dr. BILLINGS, delivered before the general Association and referred to this Section. It was voted that the address be laid upon the table till the next day, in the hope that Dr. BILLINGS would then be able to be present. Upon motion, the vote was reconsidered, and the following resolution adopted:—

Resolved, That the Section of State Medicine and Public Hygiene recognize the great importance of the co-operation of the Medical Profession in securing statistics of Disease and Mortality as referred to in the Address of Dr. Billings, and that it fully endorses the plans referred to in said address. And this Section recommends to the American Medical Association the adoption of the following preamble and resolution:—

Whereas, The Superintendent of the Census requests that the physicians of the United States will aid him in making the mortality and morbidity statistics of the United States as complete as possible, and

Whereas, It is of the highest importance to Medical Science and to Public Hygiene that this request shall be fully and universally complied with, therefore be it

Resolved, That the American Medical Association earnestly recommends to each and every physician in the United States that he shall furnish such information as is requested by the Superintendent of the Census, and that he shall keep such a record of his cases for the year beginning June 1, 1879, as will enable him to make this information accurate and reliable.

The Address of Dr. BILLINGS was then unanimously referred to the Committee of Publication.

Dr. O'SULLIVAN's Report on *The Intervention of Physicians in Education* being called for, it was announced that Dr. O'Sullivan was not present, but that he had a paper in preparation upon the subject. On motion, it was voted that the committee of which he was chairman be continued, and that he be requested to complete his report and present the same to the Section at its next session.

Dr. E. SEGUIN made remarks upon the same subject, which were favorably received.

Dr. J. F. HIBBERD, of Indiana, then read a paper on the *Relations of the Code of Ethics to State and Municipal Organizations*, which was referred to the Committee of Publication.

Letters were presented and read by the Secretary from Drs. E. M. HUNT, of New Jersey, E. A. HILDRETH, of West Virginia, and H. CARPENTER, of Oregon, expressive of their regret at their inability to be present, of their cordial co-operation with the Association, and of their interest in the progress of Public Hygiene in their respective States.

On motion, the Section adjourned.

THURSDAY, May 8.

The Section met at 3 o'clock P. M. and was called to order by the Secretary, who announced the continued illness of the Chairman. The Section elected Dr. J. F. HIBBERD Chairman *pro tem*.

Dr. S. E. CHAILLÉ presented the following resolutions, which were approved by the Section. The Secretary was instructed to transmit them to the American Medical Association, with the respectful recommendation from this Section that they be adopted.

Resolved, That a standing committee on the more efficient organization of this Association and of its branches, consisting of five members, be appointed by the President.

Resolved, That this committee be instructed to devise and recommend ways and means to secure greater uniformity as well as greater strength of organization of the State medical societies and of their auxiliary branches.

That among these ways and means the following be considered:

1. The compilation of a model code of detailed regulations for the government of State and county medical societies.

2. The requirement from every State medical society of an annual report, to contain certain data to be specified and necessary to show the condition and progress of each of these State

societies and of their auxiliary branches; to also contain a brief summary of the peculiarity of its organization and of the measures being used by it to promote the practice of State medicine. Such report should be published in the annual Transactions of each Society.

3. The publication in the Annual Transactions of this Association of a consolidated report of the above reports from each State, together with special notices of the meritorious work done by any of the branches of this Association.

4. The substitution of a periodical medical journal for the present annual volume of Transactions.

5. The non-recognition by this Association of State societies which make no provisions encouraging the organization of auxiliary societies in counties, etc.

6. The advisability of electing no person either a permanent member or a member by invitation unless such person be a member of a State medical society—provided that there be such a society recognized by this Association in his State.

7. The advisability of refusing to admit to this Association delegates from societies auxiliary to a State society unless the certificates of delegations be endorsed by an authorized officer of the State society.

8. The advisability of refusing to admit any delegates except those selected from and elected only by voting members who have paid all fees due to their respective county and State societies, and of establishing the principle that only those members of branch societies who are entitled to vote and have paid all fees due shall be entitled to be delegates.

9. The advisability of urging every medical college to have not less than one lecture delivered to every graduating class, on the importance to the profession and to the people of medical organization.

A paper by Dr. F. A. HARRIS, of Massachusetts, on *The Medical Examiner System of Massachusetts, and how it Works in Practice*, was presented by the Secretary, and was approved for publication after certain slight amendments which were indicated by the Section, for the making of which it was referred to the Secretary.

A paper on the *Registration of Diseases*, by Dr. G. B. BALCH, of New York, was also read by the Secretary, and, on motion, referred to the Committee of Publication.

The Secretary then read a paper prepared by the Chairman of the Section, Dr. J. S. BILLINGS, U. S. A., on the *Construction of Hospitals for Small Towns and Villages*, and exhibited accompa-

nying lithographic plans of such buildings. The paper was referred to the Comité of Publication.¹

Dr. A. S. PAYNE, of Virginia, then read a paper on the *Pathognomonic Pulse in Smallpox before Eruption*, which, on motion, was referred back to its author for further investigation.

The Section then adjourned.

J. T. REEVE, M.D.,
Secretary of Section.

¹ This paper, being deemed incomplete by its author, was returned to him at his request for further elaboration and re-presentation to the Section at its next annual meeting.

ADDRESS IN STATE MEDICINE AND PUBLIC HYGIENE.

By JOHN S. BILLINGS, M.D.,

SURGEON U. S. ARMY.

THE Record of Progress in State Medicine and Public Hygiene which, in accordance with the rules of the Association, I have to present, is brief. While the number of new patent ventilators, sewer gas traps, sanitary soaps, etc., has been above the average, it must be admitted that in our knowledge of the causes of disease, or of the means of avoiding or destroying those causes, little or no positive advance has been made during the year, and I shall refer to but two discoveries which have been announced in this branch of medicine, discoveries which if real would be of great interest and importance, but which thus far are in great need of satisfactory proof and confirmation.

The first of these is the announcement to the British Medical Association in August, 1878,¹ by Ewart and Simpson of the discovery of the specific microphyte of diphtheria. They claim that the specific cause of diphtheria is a minute organism closely analogous to that which is now recognized as being the cause of splenic fever or malignant pustule, namely the *bacillus anthracis*.

The bacillus of diphtheria is stated to exist in the form of exceedingly minute spores, which on reaching a suitable medium germinate into minute slender rods, or bacilli, which increase by transverse fission. After cultivation in fluids outside the body, at a temperature of about 86°, the products of these spores, when applied to a raw surface, soon lead to the formation of a diphtheritic membrane.

No details of the experiments are given, and as yet we must suspend judgment as to the correctness of the conclusions.

The second discovery referred to is that of the cause of ma-

¹ British Medical Journal, Sept. 7, 1878, p. 367.

larial fevers, announced by Dr. Eklund, surgeon of the Royal Swedish Marine, as due to a peculiar organism called the *lym-nophysalis hyalina*, which he has found in the blood.¹

Whether this is correct, or whether it should be classed with the “ague-plant” of Salisbury and the “tubercle-spores” or the *asthmatos ciliaris* of Cutter, we do not yet know.

In popularizing hygiene more progress has been made during the year than in original discovery, and the advice which has been given to the public on sanitary matters by lecturers and writers has been satisfactory as to quantity at least.

Nor has such popularization been unimportant; on the contrary, it has led to a step in this country from which we have a right to hope for great results.

From the explorations of the Congressional Commission into, and the comments of the daily press upon, the causes of the yellow fever epidemic of last year, it has come to pass that our legislators have been induced to create a National Board of Health.

So long as municipal and State authorities, while almost absolutely ignorant of the laws of preventive medicine, have no proper appreciation of their importance, and are so well satisfied with the existing condition of things as to disregard the warnings given them by their leading physicians and sanitarians—refusing even to incur the cost of obtaining reliable information or of securing scientific advice—so long there is little hope for public hygiene. But when the epidemic comes it is a stern but, for the time being, very efficacious teacher. And, as Kingsley says, “Baalzebub, god of flies, and of what flies flourish in, always does come sooner or later to visit his worshippers and bestow on them his own Cross of the Legion of Dishonor.

“He is a sunny fiend, and loves not cold, or storm, or tempest, but a bright, hot sun and a broad, blue sky. His selection of victims has often just enough of the irregular and unforeseen about it to confuse the searcher, to belie theories, to harden the hearts of those in authority by furnishing them with excuses for believing that he had nothing to do with drains or polluted water, or filth in any shape, that he was only (such an only!) the Visitation of God.”

But one thing they cannot help learning, that in its actual

¹ Archives de méd. navale. Paris, July, 1878, p. 5.

presence—whether it be called cholera, or plague, or yellow fever—the wise man and the fool are nearly alike powerless; it might have been prevented, it cannot be cured.

And as the plague induced the rulers of continental Europe to establish sanitary organizations as a part of government, and as the cholera effected the same by England, so now the third great plague of modern times, the yellow fever, may have done the same for the United States.

With the law creating the National Board of Health, I presume all are familiar. A heavy burden has been placed upon it, and, if it is to succeed, even partially, it must have your assistance and co-operation. A large part of the information, advice, and support which are essential to its work must come from the medical profession,—from individual physicians, from County and State medical societies, from State and municipal sanitary organizations. And to this Association, representing as it does all these, this call for aid from the National Health Board comes with special force and urgency.

Every medical man has information needed by this Board, and is more or less a leader and guider of public opinion as to what it should and should not do;—as to the powers which it should possess;—as to the relations which it should have to yourselves and the organizations with which you are connected. Its failure will be in a measure your failure, and its success your success.

The time has come when the character of public health legislation and organizations must be a matter of practical interest to all practitioners of medicine in this country. Sooner or later we must all come into relations with some board of health or sanitary officer. Is it not best, then, that while there is yet time we should exert ourselves to see that these sanitary boards and officials are such as we would desire to have them? that they will do our work while we aid them to do theirs?

Hitherto the great majority of practising physicians and surgeons have taken little interest in public hygiene, and have given little time or thought to the matter. At the meetings of the Section of this Association devoted to Public Hygiene and State Medicine I have rarely during the last five years seen as many as twenty persons present, and the faces have been always the same. The same condition of things exists in the British Medical Association, although not to so marked a degree. This is due largely, of course, to the superior interest of

the Sections on Surgery, Medicine, etc., but even at the meetings of the American Public Health Association, when there is nothing else present to divide the interest, it has been rare to see fifty physicians present.

With the causes of this you are no doubt all familiar, yet I hope you will permit me to refresh your memories.

The first cause is the want of accurate scientific knowledge on the subject. The best proof of this want of knowledge is the fact that there are very few physicians who would not undertake without hesitation to advise in regard to public sanitation, to act as health or quarantine officers, etc. They take as a standard the popular treatises, essays, and addresses on the subject, and measured by these their own information is certainly respectable. But the truth is that not one physician in a hundred has a thorough acquaintance with any one branch of public hygiene, nor is it reasonable to expect that this should be otherwise. Public hygiene rests upon physics, chemistry, and biology, and on the political sciences. None of these are thoroughly studied by the great majority of physicians, and it is not necessary that they should be so studied to meet the average wants of the practitioner.

Another cause of the neglect of public hygiene on the part of many physicians is the distrust which they have of the capacity and motives of some of those who are prominent as professed sanitarians.

This distrust is largely due to the relations of such sanitarians to politics and politicians. Necessarily the sanitarian must obtain pay for his studies and services, if at all, from the municipality or the State; and to obtain and retain position, as well as to be able to urge effectively the measures upon which he desires legislation, it is desirable that he should be on friendly terms with law makers and politicians.

Now to paraphrase Lord Bacon's aphorism—two kinds of men obtain offices—those who have spent their time in seeking the office, and those who have devoted their attention to the use that should be made of the office if attained, and who have therefore striven to fit themselves for it. And in public hygiene as in other things, and in this as in other countries—the last class is smaller than the first.

Physicians, like other educated men in this country, have found it less trouble to avoid the whole, than to endeavor to

distinguish the really good man from the charlatan, or to exert their influence to defeat the schemes of the latter; but from the signs of the times we may predict that it will not do for physicians to pursue this *laissez faire* policy much longer.

I suppose we all know that the members of the medical profession are the most disinterested, charitable, and humane of all professions. When they give their services gratuitously to public hospitals and dispensaries, or establish free dispensaries of their own, and when they give popular lectures or contribute articles to the daily journals on the means of preserving eyesight or good digestion, we are perfectly well aware they do this for the good of their fellow citizens and with no thought of personal benefit.

If it were otherwise,—if physicians looked upon the practice of their profession as being essentially a means of earning a decent and respectable subsistence,—we should not expect to find them especially energetic and urgent in promoting measures which tend to do away with the necessity for the existence of their profession, unless there was some special reason for it. There are countries where many physicians do look on their profession in the light just referred to, and yet are really desirous of seeing sanitary improvement go on. Why is this? I might mention a number of reasons from the strictly utilitarian and selfish point of view, but I will confine myself to three.

The first is that they often find their efforts to cure thwarted by the bad hygienic conditions of the patient. Second, that when a town or locality acquires a reputation for unhealthfulness, it is shunned by the best patrons of the physician, viz., the wealthy. Third, because the health of the physician himself and of his family is of very considerable practical interest to him.

I wish now to call the attention of the Association for a few moments to the subject of vital statistics, and more especially to the registration of deaths and disease, upon the possibility of obtaining which depends the possibility of the existence of preventive medicine as a science, since that which chemistry was before the application of the balance, or astronomy before the construction of charts,—such is public hygiene without such registration.

The most elaborate and extensive meteorological records, the most minute observations of ozone, atmospheric electricity, etc.,

the most carefully completed statistics as to density of population, occupation, drainage, or the many other factors which enter into the equation of the public health, will never avail to establish a scientific knowledge of the subject so long as the character and amount of the diseases themselves remain unknown quantities; and so long as we can only guess, or collect the guesses and opinions of others, about these matters, so long we must expect that ignorant or self-interested men will be able to place their guesses and opinions before the public upon as good, or even better, footing as those best qualified to advise.

Mortality statistics alone will not serve the purpose, nor will the opinions of physicians that certain diseases are increasing or diminishing within their districts ever be accepted as scientific data. It is time that the fact should be distinctly recognized that substantial progress in our knowledge of the causes of disease, or of the true value of methods proposed for their prevention, is not to be expected until we can learn how many cases of a given disease occur under varying circumstances in different localities. At present the only data of this kind which we possess are found in the reports of medical officers of the army and navy, and in the statistics of a few hospitals, prisons, asylums, etc.

These records relate only to limited classes, whose conditions of life are so peculiar that it is impossible to deduce from them conclusions that will hold good for the community at large;—and their scientific interest and value, great as it is, would shrink into insignificance by the side of an accurate record for ten years of the diseases of a dozen large cities in different parts of the country. I will not occupy your time with the proofs of these propositions, for I think all are more or less familiar with them, although probably the majority of physicians in common with the general public have exaggerated ideas of the value of mortality statistics, and are inclined to think that for sanitary purposes they may be nearly as useful as morbidity statistics would be, although they would at once admit that for the purposes of medical science, as regards prognosis and the effects of remedies, we must have the records of diseases as well as of death.

Let us first consider the registration of deaths—the obtaining of mortality statistics. To effect this with scientific accuracy and completeness is very difficult, even under the most favorable conditions, as, for instance, in a large public hospital, where there

are skilled diagnosticians and pathologists to furnish the data, and abundant clerical force to prepare the records. The first cause of this is the rule usually adopted that each case is to be registered but once, in order to secure a correspondence between the number of deaths and the number of causes. Whenever this rule is enforced, there must often be much uncertainty as to the particular heading to be selected in those cases in which there is a complication of disorders. From one and the same collection of cases, one physician will return a large number of cases of heart disease, another of Bright's disease, a third of phthisis, and a fourth of apoplexy.

The only satisfactory solution of this difficulty is that proposed by Prof. Gairdner, viz., to register all the causes concerned in the death. As he remarks:—

“Disease is usually a very complex phenomenon, and the causes of death in disease, though not usually so numerous as the entire morbid phenomena, are often sufficiently so to form a curiously linked chain, which the rational observer will justly desire to preserve in its integrity, and not to weaken and mutilate by the arbitrary separation of one or two of its elements. Thus, to take a very common case—a patient, long affected with Bright's disease, and its most common complication, dropsy—may be carried off by hydrothorax, pleurisy, pneumonia, pericarditis, diarrhœa, or coma, or perhaps by such a combination among these disorders as shall render it difficult for the medical attendant to say with certainty which of the complications was the direct cause of the fatal event. And, supposing that pericarditis and pleurisy have been the actual and direct causes of death, it is obviously opening up a wide field for error to register these to the exclusion of Bright's disease, or *vice versa*. According to the usual system of registration in England and in this country, the medical attendant is permitted to state several causes of death; but in the general statistical returns, only one of these can be inserted, and this must of course be selected arbitrarily by the registrar.”¹

The next great difficulty in reporting the cause of death is the fact that often the physician does not know what this cause

¹ Monthly Journal of Medical Science, vol. xiv. Edinburgh, 1852, p. 297, Dr. W. T. Gairdner on the Registration of Causes of Death in Public Institutions, etc.

is. This is true not only as regards the ignorant and unskilful, but with respect to the leaders of the profession.

Every physician meets cases in which he does not know the cause of the fatal issue, and would frankly say so in professional circles, but when it comes to stating this on an official certificate, involving the necessity for a coroner's inquest, there are very few physicians who are not willing to certify that death was due to some symptoms observed, such as convulsions, dropsy, paralysis, or, if none of these are available, to paralysis of the heart, nervous apoplexy, or apnœa, which are always safe causes to assign. And if this be distinctly understood by the registrars, it is by no means objectionable. Let it be generally agreed by physicians that, in cases where they do not know what was the matter, but are prepared to certify that there is no necessity for a judicial inquiry, they may certify that death was due to a symptom, or to paralysis of the heart, or apnœa, and then the registrar will understand that all such certificates are to be passed upon simply as cause unknown;—and here, I quote again from Dr. Gairdner:—

“The nosological classification employed should be such as to adapt itself at once to the most vague and the most precise information. It is obviously impossible that all cases of disease should be observed with equal precision, even by medical men. A long or short attendance, full or deficient information from the patient or relatives; different degrees of professional knowledge, absolute difficulties and uncertainties of diagnosis; the performance of a post-mortem examination, and the care employed in this duty, are all so many circumstances tending to introduce variations into the results, which can only be in a measure met by having a *variety of headings* even for the same disease. . . . It will perhaps appear to some persons that a registration conducted on the principles which I have mentioned will contain a large mass of superfluities, which will not repay the trouble of collection. Moreover, it will be said that some of the circumstances which I propose to register are not independent diseases, but merely symptoms; such, for instance, as syncope, dropsy, emaciation, hæmoptysis. To the latter objection I would reply that no ideas in pathology are more vague and unsettled than those of the mutual dependence of disease and symptoms.

“The independent diseases of one age become the symptoms of

the next; ascites is displaced by cirrhosis of the liver, anasarca by disease of the kidney and heart, hæmoptysis by tubercle of the lung, hectic fever by a multitude of organic diseases, etc. etc. . . . We may easily be too precipitate in following the march of improvement, and it will often be a grave error, on the ground of an apparent superfluity of names, to remove from the nosology, or even to omit in particular cases, symptoms so important as dropsy or hemorrhage."

Nomenclature should, as it seems to me, be kept distinct from nosology.

We really need two systems of nomenclature,—one to be employed by the clinical physician, and which shall represent the character of the symptoms and phenomena observed during life; the other to be employed in the post-mortem room, and by the pathological anatomist, to express the results of disease observed after death. And in preparing these nomenclatures in the shape of lists of names to be used by physicians, it seems to me they would serve their purpose much better if the names were arranged in simple alphabetical or dictionary order, instead of attempting to classify them according to some nosological arrangement, as is usually the case.

This classification should be effected by the registrar at the central office, and it can be done by him as well with the arrangement I have suggested as in any other way.

With regard to the registration of deaths in a community, it is now well recognized that the only way to secure this is to forbid all burials, entombments, or removals of human bodies, without a special permit, and that this permit shall not be given until the information required for registration is furnished.

It must be understood that the burial or removal of a body without such permit is a grave offence, implying the commission of murder and the attempt to conceal it. It should, therefore, be the subject of State rather than of municipal law.

What information should be required previous to giving the permit, and who is to furnish it with regard to any dead body, has been pointed out by Beneke.¹ There are five questions to be answered to the State: 1st. Is the death real? 2d. Who is it that is dead? 3d. Is the death natural? 4th. What was

¹ For a full account of the methods pursued in European countries for obtaining records of death, consult F. W. Beneke, *Vorlegen zur Organisation der Mortalitäts-Statistik in Deutschland*. Marburg, 1875, 8vo.

the cause of death? 5th. Is there a possibility that the dead body may be a cause of disease?

Hence arises the need for an official inspection of each dead body, such as is enforced more or less rigorously in Holland, Belgium, Denmark, Switzerland, Austria, Bavaria, Italy, and in many of the cities of the German Empire.

By the majority of persons, physicians included, it is taken for granted that the method of estimating the comparative healthfulness of a town or given locality is by the comparison of death-rates; and that, if the data for this purpose can be obtained with reasonable accuracy, the problem can be solved at once by any one acquainted with the ordinary rules of arithmetic. So far is this from being the case that it will be found that numerous corrections and interpolations as to the effects of birth-rate, migration, etc., must be made before the results of mortality registration can be accepted as having any scientific value, and in consulting the most unquestioned and reliable statistics of this class, it will be found that the more eminent the statistician the more cautious he is in making positive deductions from his figures. It is, however, by no means necessary to go to the other extreme and declare, with Dr. Letheby and Mr. Hawkesley, that mortuary statistics are useless,¹ because absolute accuracy cannot be claimed for them, or because they do not show more than they do.

The great difficulty is, that to furnish such data requires time, trouble, and a little expense, and that usually—in this country, at least—no sufficient consideration is offered for the labor. This objection is fatal to all volunteer attempts on the part of medical societies or associations to collect such statistics, except in very limited localities, and under exceptional circumstances. A number of such attempts have been made in Great Britain and in this country, but with very little success.

At the meeting of the American Medical Association, at Philadelphia, in 1855, Dr. J. G. Orton, of New York, introduced the following resolutions:—

Resolved, That each county medical society, or (in parts of the country where such has not been established) any duly organized medical association, be requested to amend its constitution by attaching thereto the following article:—

¹ Sanitary Record, 1874, October 31, pp. 305, 308.

“It shall be the duty of each member of this Society to keep a faithful record of the diseases which may fall under his observation during each month, according to the classification adopted by this convention in May, 1847, stating the age and sex, occupation and nativity, of the patient, the average duration of the disease, and finally, their recovery or death, and to report the same in writing to the secretary on or before the first day of February of each year, who shall transmit a digest thereof to the State Medical Society, and also to the appropriate committee appointed by the American Medical Association for its reception.”

Resolved, That each incorporated hospital, infirmary, and asylum, be invited to furnish a copy of their annual reports for the use of the committees of their respective States.

Resolved, That the State committees, appointed by this Association to report on the prevailing diseases of their respective localities, shall receive and arrange a digest of the reports transmitted to them by the secretaries of the various county societies, and report the same at the annual meeting of this Association.

Resolved, That the first day of January be the time fixed at which the object of these resolutions shall be carried into effect, and that the several county societies and associations be requested to amend their constitutions, as heretofore recommended, at as early a date as practicable, and to report to the State Committee their willingness or unwillingness to acquiesce in the request of this Association.”

No action was taken on this. The matter was again brought up by Dr. Palmer at the meetings of 1856 and 1857, and the resolutions proposed by him, embodying regulations of State and county societies on a plan which provided for the collection of statistics of disease, were adopted in 1857.

I know of but one report such as the resolutions contemplated; and that is the one made by Dr. T. C. Brinsmade, published in the *Transactions of the Medical Society of the State of New York* for 1858;—which is a very complete and elaborate record of the experience of one physician, but which it is in vain to hope to see imitated by even one in a thousand general practitioners.

In several of the State societies, as, for instance, in Pennsylvania and New Jersey, attempts have been made, through the county societies, to obtain and record information as to prevailing diseases, but no results of scientific value have been obtained.

In this connection I would allude to a very compact and simple

form of pocket register devised by Dr. Henry Hartshorne for the use of private physicians, and issued under the sanction of the State Medical Society. Dr. Rumsey,¹ in a paper urging voluntary registration of disease, speaks of the registration proposed by Dr. Hartshorne as actually accomplished, but in this he is in error, and Dr. Hartshorne in a recent letter informs me that "the physicians of Philadelphia and Pennsylvania, so far as I could learn, did not largely avail themselves of the convenience."

Attempts have also been made by the State Boards of Health of Massachusetts and of Michigan to obtain, through the voluntary co-operation of physicians, information as to the prevalence of certain diseases, but the results have hardly warranted the time and trouble expended.

If the statistics desired cannot be obtained by voluntary associated effort on the part of physicians, how is it with regard to compulsory legislation? If an attempt is to be made to compel physicians under penalties to furnish data for the registration of disease, it is evident that, in the existing condition of society, it would be utterly impossible to enforce it for all diseases. This is thoroughly recognized by even the most enthusiastic advocates of registration: they only ask the data for some diseases.

These should be diseases in which a reasonable certainty in diagnosis may be expected from the average practitioner, and they should be such as are probably due to locality, or which are contagious, or, better, infective in the German sense of the word, which is by no means synonymous with infectious, as will be seen by examination of the first part of the English translation of Ziemssen's *Handbuch*.

Fortunately, these requirements coincide to a great extent, and the spreading diseases, together with those which we have reason to think are closely connected with local causes, as, for instance, goitre, or the numerous varieties of the Oriental sore, are for the most part easy of diagnosis. It is true that we meet with grave difficulties in some diseases of which statistical data are extremely desirable, as, for instance, phthisis.

The practical question then narrows itself to this: How can we, by the aid of legislation, obtain valuable statistics of a few

¹ Essays and papers on some fallacies of statistics, by H. W. Rumsey. London, 1875, 8vo. p. 52.

diseases, especially of those most dangerous to the public health?

The objections to the compulsory registration of infectious diseases for the purpose of preventing their spread, are nowhere presented more forcibly than by Dr. S. W. North, in papers which will be found in the *Sanitary Record* for May 24 and Aug. 2, 1878.

He claims that it is practically useless, because to prevent the spread of these diseases requires absolute isolation for long periods of time, and asks, How can a workman refrain from seeing his child for a month? and that when the information interfered with pecuniary interests, as in many cases it certainly would, patients would gravitate towards quacks and such physicians as would find it convenient to have no opinion, that to be valuable it requires accurate and prompt diagnosis, that there is the possibility of difference in this respect between the health officer and the medical man, that old professional men find themselves criticized by young men knowing little of disease, etc. etc.

He thinks, however, that every case of infectious disease attended under order of the poor-law authorities should be reported; also all such cases from dispensaries and public hospitals, and possibly also in hotels and boarding-houses.

In Bolton, England, compulsory registration of infectious disease was commenced in 1877, under the following laws:—

“Sect. 87. In order to secure that due notice be given to the corporation of any inmate of any building used for human habitation who is suffering from smallpox, cholera, or any contagious or infectious fever, the following provisions shall have effect (that is to say): (1) If any such inmate be suffering from any such disease as aforesaid, the occupier or person having the management or control of such building shall, as soon as he shall become aware of the existence in any such inmate of any such disease, forthwith give notice to the corporation, at the town hall, of the existence in such inmate of such disease. (2) If such inmate be not a member of the family of such occupier or person, the head of the family (resident in such building) to which such inmate belongs, or, if there be no such head then such inmate (unless prevented by reason of such disease or of youth), shall, on becoming aware of the existence in such inmate or in his own person, as the case may be, of such disease, forth-

with give notice thereof to such occupier or person. (3) The corporation shall provide and supply gratuitously to every registered medical practitioner, resident or practising in the borough, forms for the certificate or declaration by such medical practitioner of the particulars hereinafter mentioned in relation to such cases, according to the form set forth in the 5th schedule to this Act. (4) Every medical practitioner attending on or called in to visit such inmate shall, on becoming aware that such inmate is suffering from any such disease as aforesaid, forthwith fill up, sign, and send to the corporation, at the town hall, a certificate or declaration stating, according to the forms prescribed and supplied to him by the corporation, the name of such inmate, the situation of such building, and the nature of the disease from which such inmate is suffering. (5) The corporation shall pay, to every medical practitioner who shall in pursuance of this section duly make and give any such certificate or declaration, a fee of 2s. 6d. for each such certificate or declaration; and any person who shall offend against this enactment (unless ignorant thereof, the burden of the proof of which shall be on him) shall for every such offence be liable to a penalty not exceeding ten pounds."

Some difficulties occurred in carrying out this law, and in 1878 it was agreed between the corporation and the Bolton Medical Society that (1) "Certificates be given only in the case of any one of the following diseases, viz., smallpox, cholera, measles, scarlet fever, typhoid fever, typhus fever, puerperal fever, and diphtheria. (2) That a book of certificates, stamped and directed for transmission through the post office, be delivered to every medical practitioner, and that the medical practitioner in attendance report the case by forthwith sending a certificate to the town hall. (3) That a further certificate be not given in respect of the same disease occurring to any other inmate in the same building within thirty days after the giving of the first certificate."

The result is reported as fairly satisfactory. During twelve months 1995 certificates were furnished, the estimated cost being £250, or, if every case were reported, £400. The population of Bolton is about 80,000.¹

Having thus pointed out some of the obstacles and difficulties

¹ Report of Mr. E. Sargent, Sanitary Record, Oct. 25, 1878, p. 266.

in the way of obtaining satisfactory statistics of mortality and of disease even in a single city or county, I wish now to invite your special attention to the opportunity which is offered to obtain such statistics for the whole United States in such a way that they may be of real and positive value, and will furnish a definite foundation for legislation with regard to the public health.

This opportunity is afforded by the law passed last winter with regard to the taking of the United States census, and by the appointment as superintendent of that census of a gentleman, General Francis A. Walker, who is especially desirous of having these statistics collected, collated, and published in such a manner as to produce the best possible results, as will appear from the following letter:—

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE.

WASHINGTON, D. C., April 17, 1879.

MY DEAR DR. BILLINGS: You are perhaps aware that, by the act providing for the tenth census, the agents of the Census Office are required to obtain information "as to the physical and mental health of each person enumerated." I have not yet had time to prepare the specific interrogatories to be added to the schedules for this purpose, but you will see at once the vast importance of this field thus opened, and the high possible value of the results which may be reached. It is evident that it will be in the power of the medical profession of the country to give assistance of the greatest value to the government in this respect, and I should be greatly pleased if, in your proposed address to the American Medical Association in May, you would ask the attention of the profession to the subject, and solicit their active co-operation with the Census Office in its efforts to accomplish the purpose of the law.

At every point the value of the census must greatly depend upon the good will and co-operation of the community at large, but especially in matters so intricate and delicate as the mortality and morbidity statistics of the country, must the Census Office look to the medical profession, not only for technical assistance, but for the active exertion of their influence in predisposing the public mind to a cheerful compliance with the requirements of the law.

Very truly yours,

FRANCIS A. WALKER,

Superintendent of Census.

In addition to this I am authorized by General Walker to say that nothing shall be wanting on his part to secure completeness and accuracy,—that he seeks counsel from those most familiar with the subject as to the methods to be pursued in the work,—that he will have his agents fully instructed as to these methods, and that he will furnish means for the collection and publication of the results in the best possible manner.

To insure the success of this part of his work he earnestly desires the co-operation of the medical profession, feeling sure that without such aid the information which his agents can collect will be necessarily incomplete, and to some extent erroneous. He will instruct takers of the census throughout the several census districts to call upon physicians with their mortality and morbidity schedules, and request them to verify them as far as possible. In behalf of the Census Authorities, of the National Board of Health, and of the American Public Health Association, for all of whom I feel authorized to speak, I would appeal to the physicians of the United States, through this Association as their representative, to prepare themselves as far as possible to verify these schedules and to furnish the information needed for the purposes of the census.

The best way to do this would be for each physician to commence on the first of June keeping a list of all cases of death which occur in his practice, noting name, age, sex, and cause or causes of death in accordance with the suggestions previously made. In large cities where there is a formal registration of the causes of death, and where the physician has signed a certificate as to such cause, this would be unnecessary.

My appeal is made especially to those physicians in the smaller towns and villages and in the country where no such registration has been practised, and I sincerely hope that each and every one will feel it his duty to attend to this matter for the year ending June 1, 1880. Record books for this purpose will be furnished from the census office to every physician in the United States, so far as the addresses of the physicians can be obtained.

I have no doubt that each physician will be specially visited by the census-taker. But, in case he is not, he should be prepared to send his list to the superintendent of the census at Washington to serve as a check upon the schedules furnished by the census agent.

And in commencing to take these lists the physician should

remember that he also is mortal, and should make provision that, in case of his death prior to the calling of the census-marshal, the register which he has kept shall be made available for the good of the public and of the profession.

I sincerely hope that this Association may see proper to put the stamp of its approval upon the suggestions here made, and that the medical press throughout the country will exert its great powers to induce physicians everywhere to heartily co-operate in carrying out the plan agreed upon.

If so many as one-half of the practising physicians of the United States will keep the records and furnish the information here suggested, the result will be a great step in advance—for the example will be followed in other censuses—in Europe as well as in this country. Those who do contribute will be remembered in the distribution of the published results, and this, and the consciousness of having done their duty, is all the reward that can be promised, but I feel sure that this is quite enough.

In such matters you must be the pilots of the State; you are the persons to whom she must look for counsel and wisdom; that wisdom of which it is said, "length of days is in her right hand, and in her left hand riches and honor."

THE REGULATION OF MEDICAL PRACTICE BY STATE BOARDS OF HEALTH, AS EXEMPLIFIED BY THE EXECUTION OF THE LAW IN ILLINOIS.

BY H. O. JOHNSON, M. D.,
ILLINOIS.

THE Legislature of Illinois, at its session of 1877, passed a bill creating a State Board of Health, and at the same session an Act to regulate the practice of medicine in the State of Illinois. The duty of carrying into execution this last law was committed to the State Board of Health. The bill provides that every person practising medicine in any of its departments shall possess the qualifications required by this Act. If a graduate of medicine, he shall present his diploma to the State Board of Health. If the diploma is found genuine, and if the person named therein be the person claiming and presenting the same, the State Board of Health shall issue a certificate to that effect, and such diploma and certificate shall be conclusive as to the right of the lawful holder of the same to practise medicine in this State. If not a graduate, he shall present himself before said Board and submit himself to such examination as the Board shall require, and if the examination be satisfactory the said Board shall issue its certificate in accordance with the facts, and the lawful holder of the certificate shall be entitled to all the rights and privileges herein mentioned; the lawful holder of a diploma shall be required to make an affidavit that he is the legal possessor of the same; and that he is the person therein named. These certificates, whether issued to graduates, or upon examination, shall be recorded in the office of the clerk of the county in which the holder resides. The register of the county clerk shall be open to public inspection.

The examination of those not graduates may be wholly or partly in writing, and sufficiently strict to test the qualifications of the candidate as a practitioner. The Board has power to re-

fuse certificates for unprofessional or dishonorable conduct and to revoke certificates for like cause. The law requires the Board to grant certificates to the holders of diplomas from legally chartered medical institutions in good standing, giving to the Board the power to determine what colleges are in good standing. It also defines a practitioner of medicine to be one who shall profess publicly to be a physician and to prescribe for the sick, or who shall append to his name the letters "M. D." Itinerant vendors of any drug, or application for the treatment of the sick, or cure of disease, are required to pay a license of \$100 per month. The punishment for any violation of the Act is a fine of not less than \$50 nor more than \$500, or by imprisonment in the county jail for not less than one month or more than one year, or both. The provisions of the Act do not apply to persons who have been in the practice of medicine in the State of Illinois ten years or more.

This law went into effect July 1, 1877. The Board organized and soon after July began its work. Its utility was a matter upon which the profession was by no means a unit. By very many physicians it was thought inexpedient and perhaps impossible to carry out its provisions so as to better to any appreciable degree the condition and qualifications of those engaged in practice. The greatest difficulty was apprehended from the apparently conflicting schools of medicine. It was thought impossible to form a Board that should work well together and which should have the confidence of those holding these widely different theories upon therapeutics. For these reasons the formation of the Board and its action was on the part of very many waited for with indifference or distrust. The Governor, in making the appointments, recognizing the existing facts, appointed three physicians called "regular," for the want of a better term, one homœopath, one eclectic, and two who were not physicians but who were men deservedly held in high esteem as thoroughly accomplished and scientific gentlemen, both of them at the head of prominent institutions of learning. It was thus made a mixed Board. In the prosecution of the work—the regulation of the practice of medicine—there were found to be seven classes or grades of doctors.

1st. Those who hold diplomas from legally organized medical colleges in good standing, that is, having the confidence of the profession at large.

2d. Those holding diplomas from colleges not recognized as in good standing, either for the reason that the curriculum is too short, too narrow, and the work of teaching too carelessly or imperfectly done, or because they are not teaching bodies at all, though chartered schools, their function being the sale of diplomas. As medical colleges they are myths, as business organizations they have only an indifferent success.

3d. Midwives—women engaged in that special department of practice.

4th. Those holding diplomas that do not belong to them, obtained by inheritance, by borrowing, or by theft. Among this class some change the name of the diploma, while others, sacredly respecting the venerable document, issued perhaps before they were born, only clumsily mutilate its date and change their own name so as to accommodate the holder to the diploma. Forty-one practitioners were found under assumed names.

5th. Non-holders of diplomas who had been in practice ten years or more in Illinois.

6th. Non-holders of diplomas who had not been in practice ten years in Illinois.

7th. A class of itinerants going from town to town advertising in advance that they will work their wonders at such a place, on such days of such month, etc.

The work of the Board had to do with this heterogeneous mass. It commenced first by inviting physicians holding diplomas to present them for verification; second, by holding sessions at different points in the State where those not graduates could present themselves for examination. These examinations have been conducted in writing by different members of the Board, and from the papers seen by the writer are judged to have been practical and thorough. The fact that not one-half of those presenting themselves passed justifies the belief that in this respect the Board has done its duty.

The report of the Board presented to the Governor in December, 1878, gives in detail the results of this work up to that date, and I beg leave to present a few abstracts which may be of interest to the Section. There have been issued, to holders of diplomas from schools deemed by the Board in good standing, 3858 certificates; upon examination of non-graduates of less than ten years' standing, 150; upon affidavits from non-graduates of more than ten years' practice, 942; being a total

of 4950. Certificates were also issued to 420 midwives; making a grand total of certificates of 5370. It is well known that in our large cities there are quite a number of women engaged in this special work. Examinations were held, and the qualifications of this class of practitioners determined. In addition to all these holders of certificates, there are quite a number who do not come within the requirements of the law on account of time in practice. The Board estimated that there were in the city when the Act went into effect, July, 1877, about 3000 practitioners of medicine not graduates from any medical college. Of these only 371 have presented themselves for examination, of whom 150 only have passed successfully that ordeal. 950 had been in practice ten years or more, and were consequently not required to present themselves for such examination; about 450 have graduated from medical schools; the cases of about 400 are still undetermined by the Board, while 150 are evading the provisions of the law by every possible means, and 1400 have left the State.

The effect of this law and its execution has, I think, been much more satisfactory both to the profession and the public than its most ardent supporters dared to hope. The attention of the non professional public has been called to the importance of knowledge as a qualification for practice. A general interest has been awakened upon this subject which in its influence will lead to a more just estimate of the physician and a better understanding of the responsibilities of his office.

The Board is invested with authority to determine what constitutes a medical college in good standing. At a meeting held in Cairo, November 5, 1877, the following resolutions were adopted:—

“*Resolved*, That on and after July 1, 1878, the Board will not consider any school in good standing which holds two graduating courses in one year.

“*Resolved*, That on and after July 1, 1878, the Board will not recognize the diplomas of any medical school which does not require of its candidates for graduation the actual attendance on at least two full courses of lectures with an interval of six months or more between each course.”

These resolutions make it impossible for the graduates of schools which give two graduating courses in each year, or which do not require an interval of at least six months between

each course, to practise medicine in any of its departments in the State of Illinois. This action has led to the extension of the lecture term and the abandonment of the two-term system in one of the medical colleges of Chicago—the “eclectic.” It is believed that this action has had some influence on medical colleges outside of the State. In other words the action of the Board under the law has been the means of bettering a certain class of medical institutions, whose status in the estimation of the profession was somewhat equivocal. The execution of the law has also given encouragement to the legally qualified physicians. It has secured for them more honorable association, and has given to them the means of certifying to the public their own claims to the confidence of the people.

Fears have been entertained that a law, such as that placed upon the statutes of Illinois, could not be executed; that it must remain a dead letter; that it would be impossible to hunt up and investigate and determine the status of the thousands of practitioners scattered from the lake to the river. This task is no doubt a difficult one, and would be still more so but for the existence of the State Board of Health and the provisions of the organic law requiring the registration of practitioners as a part of the machinery necessary for securing the vital statistics of the State. The State Board requires a registration in the office of the county clerk of each county of every person practising medicine or midwifery. The neglect of such registration subjects the person so neglecting to the penalty for the violation of the law regulating the practice of medicine. It will be easily seen that if a few only of the practitioners become registered it will be for their interest to determine the fact that all others are also registered. In this way every practitioner who has complied with the law is made an aid to the State Board in the execution of its provisions. It has been found to be practically the fact that in many counties not a single person is engaged in the practice of medicine who has not complied with the law, and this not so much through the immediate intervention of the State Board as through the action of the local physicians. A suspicion that a neighboring or competing practitioner has not complied with this law, or that he is disqualified by law, leads at once to an investigation, and, in case of the neglect or refusal to comply or qualify, to prosecution. The authority of

the Board to revoke licenses has been tested in the courts, and so far has been sustained.

In view of all these facts it is quite evident, I think, that it is possible to regulate the practice of medicine and to vastly improve its condition, and that this can be done and probably best done by State Boards of Health.

In conclusion the writer begs leave to suggest that it is the duty of the State to protect its citizens from the injuries they may sustain from the practice of incompetent physicians and surgeons as well as from any other source of danger to public health. The mode in which this protection can be best extended is one upon which there may be differences of opinion; in fact there may be different modes equally efficient. But that adopted by the State of Illinois, if it could be carried still further and made more complete in this investigation of the status of every practitioner of medicine, would, as it seems to me, be amply sufficient. A diploma from any medical college ought not to be accepted of itself as the evidence of a qualification for the discharge of the duties of the profession. It is true a Board invested with the power of discriminating like that of this State perhaps may be trusted to determine what colleges do give to their graduates an education qualifying them for these responsibilities; but practically it is found very difficult to make such discrimination. An examination should be held of every practitioner of medicine; that examination, if successful, should entitle him to a license to practise. The colleges would then be relegated to their legitimate places as teaching bodies, and not as bodies empowered to give authority to practise. The colleges that have the best teachers, whose students are most successful in passing this examination, and which are therefore evidently rendering to the community the highest services, would become the most popular, and would justly receive at the hands of the public that recognition which they deserve.

But the consideration of this subject leads us beyond the scope and purview of this paper, which was simply to submit the results of the effort in the State of Illinois to regulate by law the practice of medicine.

STATE MEDICINE AND STATE MEDICAL SOCIETIES.

By STANFORD E. CHAILLÉ, A. M., M. D.,

NEW ORLEANS, LOUISIANA.

STUDY of the last ten volumes of the annual Transactions of this Association, and also of the constitutions and histories of the thirty-seven State Medical Societies in the present thirty-eight States, has inspired a strong conviction that there are two important questions which have not been sufficiently considered by this Association, and especially by the "Section of State Medicine and Public Hygiene." One of these questions is: What is State Medicine? The other is: What can be done by this Association to promote its practice?—for the art is now far behind the science of State Medicine, as is forcibly illustrated by the frequent prevalence of smallpox, notwithstanding the power given by vaccination to stamp it out. As to the latter question, it seems evident that the progress of State Medicine depends upon enlightenment of public opinion, that this must be promoted by an enlightened and organized medical profession, and that—inasmuch as this Association since 1874 derives its power from, and depends for its life on, the State Medical Societies, with their auxiliary county and district societies—this second question resolves itself, in large measure, into: What can this Association do to enlighten and more efficiently organize its own branches, the State Medical Societies? These questions, with some subjects incidental thereto, will now be considered.

WHAT IS STATE MEDICINE?

The adjective-noun being used generically, as in statecraft and statesmanship, *State Medicine is the application by the State of medical knowledge to the common weal; and embraces every subject for the comprehension of which medical knowledge, and for the execution of which State authority, are indispensable.*

Its bounds are necessarily as limited as may be the authority of the government; so that, in the United States, State Medicine is restricted by the Constitution, so far as the national government is concerned, within narrow bounds, within even narrower bounds than as to our county and municipal governments, while our State governments have ample and undisputed authority over each of its four chief subdivisions, viz.: Public Institutions for the Sick and the Infirm; Medical Education; Medical Jurisprudence, or Forensic Medicine; and Public Hygiene, or Preventive Medicine.

If the definition given be correct, then the titles of the 4th and 5th Sections of this Association, viz., "Medical Jurisprudence, Chemistry, and Psychology" for the former, and "State Medicine and Public Hygiene" for the latter, are due to a misconception of what State Medicine really is, and not only promote confusion of ideas in this Association, but also in all of its branches. Further, these titles contribute to strengthen the prevalent professional tendency, which I deem false and mischievous, to regard Public Hygiene, which is no more than the most important branch of State Medicine, as synonymous therewith.

To illustrate still farther the definition of State Medicine, it will be well to enumerate the most important subjects which belong to each of its four branches, and merit special attention because of the defects of our laws in regard to them.

PUBLIC INSTITUTIONS FOR THE SICK AND THE INFIRM.

The subjects appertaining to this branch are the organization and maintenance of hospitals, dispensaries, infirmaries, and sanatoria; of asylums for the insane and for inebriates; and of asylums, *educational* as well as medical, for idiots and feeble-minded children, for mutes, and for the blind.

MEDICAL EDUCATION.

The subjects appertaining to this branch are the organization, maintenance, and governmental regulation of medical colleges; the promotion of means to facilitate the study of anatomy and clinical medicine, surgery, and obstetrics; the foundation and support of medical libraries, museums, laboratories, and of botanical and zoological conservatories; the encouragement of

original research ; and the regulation of the legal qualifications requisite to practice medicine, surgery, midwifery, and dentistry—not only of those who have received no medical education, but also of those who are graduated doctors in medicine.

MEDICAL JURISPRUDENCE.

The subjects of present chief interest appertaining to this branch are the improvement of the laws relating to insanity, inebriety, poisoning, fœticide, malpractice, and to medical witnesses in four important particulars. These are, better provision for securing properly qualified physicians to serve as *ordinary* witnesses to medical *facts*, such facts as are derived from coroners' inquests, and from the observation and examination of those alleged to be insane ; thoroughly competent medical experts as *skilled* witnesses to medical *opinions*, and better legal methods for the selecting of such experts, and the taking of their testimony ; the adequate compensation of medical experts ; and proper protection to prevent the disclosure, by force of law, of confidential communications made, and necessary to be made, by a patient to his physician.

PUBLIC HYGIENE.

Whenever civilization has so far advanced that social order has been, by law, firmly secured, then Public Hygiene, however much neglected, is the subject of greatest importance. As a science, it may be said to consist in the study of *the avoidable causes of disease and death, their removal, extent, cost, and influence on morality and human progress*. As an art, many subjects appertain to this branch of State medicine, and chief among these are: the establishment of efficient and central boards of health, with auxiliary local boards, and an efficient system for the registration, not only of marriages, births, and deaths, but also of prevailing diseases ; the introduction into the public schools of instruction by competent teachers in the elements of hygiene ; adequate provision for food neither adulterated nor diseased, for an abundant supply of uncontaminated water, and also of man's first and greatest need, pure air, which nature lavishly supplies and man recklessly poisons ; the suppression of numerous sanitary nuisances, and the regulation of many insanitary occupations ; the proper construction of healthy houses for schools and all other purposes ; the drainage and irrigation

of the land for sanitary as well as for money-making ends; the topographical sanitary survey of every section of the country—such surveys as Massachusetts is said to have effected in 1849, and New York to have initiated in 1875; protection from contagious and infectious diseases, and the sweeping away of the removable causes of many other diseases; and the regulation of sexual intercourse, even to the extent of castration or spaying, to the end, not only that venereal diseases may be diminished, but also that a corrupt progeny may cease to curse humanity and burthen its progress. While this list embraces the chief subjects belonging to public hygiene, many unmentioned expedients are required to redress numerous insanitary evils, which have increased, and will increase in number and extent as population increases in density, and the arts of advancing civilization multiply. Hence the necessities for an efficient system of public hygiene are destined to increase year by year.

Of the various subjects of State medicine now enumerated there are at least a dozen which, before proceeding to consider the second part of this article, deserve brief notice. These subjects refer to inebriate asylums, and measures to control inebriates; the education of idiots and feeble-minded children; the regulation by law of the qualifications necessary to practice medicine; foeticide; malpractice; the compensation of medical experts; the protection of confidential communications; coroners; expert witnesses to medical opinions; introduction into public schools of a text-book on the elements of hygiene; boards of health; and the registration of vital statistics.

These subjects deserve farther notice because of the superior importance of some of them, and because they, although attracting in recent years professional attention, have failed to secure from the profession such treatment as is likely to promote their progress. For, to promote the practice of State medicine its subjects must be discussed from a legal as well as from a medical standpoint, must be rendered comprehensible to the public, and must be advocated by a united and organized profession. In matters of State medicine, physicians are prone to denounce evils, and to dwell upon the reasons *why* these evils should be corrected, but fail to teach *how* they can be corrected. Sufficient importance is rarely given to such important practical considerations, as that law breaking is as easy as law mak-

ing; that it requires no wisdom to enact a law, but great wisdom to enact, on many subjects, laws which can be enforced; and that the history of legislation is glutted with the enactment of laws which not only failed to accomplish the object intended, but did accomplish a very different one, at times even bringing the object sought for into public contempt. Rarely do writers on State medicine seem to realize the truth of the lessons taught by students of the philosophy of law making, that there is a class of subjects in regard to which laws can be enacted in advance of public opinion without fear of bad results, for their *educational* influence on the people—and apparently these subjects are those in regard to which laws, if enacted, depend for their execution not on the action of the people, but on the discharge of duty by officials specially charged therewith—but that there is another class of subjects in regard to which “no laws can successfully precede their public sanction,” and, if enacted, violation of and contempt for law ensues. No law can be enforced which requires for its execution, not the discharge of duty by officials, but the active aid of a large number of people who are opposed or attach no value to the execution of the law, and who, by their number or the nature of the subject, cannot be reached by the penalties for violation of the law. Unfortunately for the progress of State medicine, to this last class of laws belong some of its most important subjects, such as the regulation of the practice of medicine, foeticide, compulsory vaccination, and the registration of vital statistics, and their satisfactory disposal cannot be hoped for until an enlightened and organized medical profession exercises its potent influence on public opinion.

Medical literature abounds with complaints in regard to the dozen subjects specified, yet it would be difficult to find a single article on any one of them, giving the history of the laws which have been enacted, the results of these laws, and such other information as would teach *how* present evils can best be corrected. If the legislative history, in every State, of these and kindred subjects were annually reported, a consolidated report of these State reports would undoubtedly tend to disseminate a knowledge of the practice of State medicine, and to advance its progress throughout the United States.

In regard to the legislation in behalf of inebriate asylums and the control of inebriates, the education of idiots and feeble-

mindful children, the suppression of fœticide, the protection of confidential communications, the securing of competent expert evidence to medical opinions, the introduction into the public schools of a text-book on hygiene, and laws requisite to render Boards of Health efficient; how very few physicians are sufficiently well informed to impress, with the force of their arguments, either the people or their representatives. In reference to some of these subjects, facts of interest have been cited in the appendix to this article, where will also be found contributions to the legislative history of malpractice (*vide* Maine), the compensation of experts (*vide* Indiana), and the laws of coroners, who have been wisely abolished in one State, as they promptly should be in all (*vide* Massachusetts). The remaining two of the twelve subjects, the regulation by law of the qualifications requisite to practise medicine, and the establishment of an efficient registration of vital statistics, deserve from their great importance further consideration—in fact, much more than will be given.

As nearly every State Medical Society is now discussing, and striving to secure or improve, laws to regulate the practice of medicine, the following facts deserve to be more generally known. About 1840, every State then in the Union, except North Carolina, Pennsylvania, and Virginia, had, or had had the now much desired medical examining boards, appointed in some cases by the Governor, but in many cases by the regular medical profession itself, through State or county medical societies. These boards did not prove satisfactory to the profession, and were so unsatisfactory to the sovereign people that their representatives did, from about 1840 to 1852, repeal or annul, in nearly if not quite all the States, the laws establishing such boards. If we would profit by the experience of our fathers, we should know all the causes of their failure, yet this knowledge has been supplied most inadequately. North Carolina since 1859, and a few other States have, on this subject, old laws still unrepealed; and, since 1873 not less than seven States—Alabama in 1877, California 1876 and 1878, Kentucky 1874, New Hampshire 1875, New York 1874, Texas 1873 and 1876, and Vermont 1876 and 1878¹—have enacted new laws; yet medical literature does not contain a single instructive report as to the comparative merits

¹ It is reported that Missouri has a worthless law, and it is believed that Ohio has a law probably worthless also.

of these laws, and as to their operation, whether satisfactory to both profession and people, and whether likely to be improved by amendments or to be repealed.

The history of American State legislation on this subject seems to conclusively prove the following facts: that laws which debar homœopaths, eclectics, and other practitioners of any special or exclusive system of therapeutics from the practice of medicine, cannot be enforced if enacted; that no laws have yet established a satisfactory method to determine the qualifications necessary for a practitioner of medicine; and that no adequate measures have yet been devised to inflict the penalties of the law on its violators. The only law ever yet enacted on this subject by any English-speaking people, which, tested by experience, has proved worthy of imitation, is the British Registration Law of 1858. This law is reported to have effected great good. It is executed by a General Council of Medical Education and Registration composed of twenty-four paid officers (paid, as I infer, by the British Medical Association); and it is based on the principle that "it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners." Those whom we designate irregulars are, if found qualified, registered equally with regulars, and fraudulent registration is liable to severe penalties. Only those physicians who are registered are recognized by the courts, are exempt from jury and militia duty, and enjoy the rights to practise and collect fees, to sign legal certificates, and to serve as medical officers in the army, navy, and civil service.

A kindred and not less important question involved in and possibly to be eventually solved by laws regulating the qualifications of medical practitioners is, What measures can be adopted to induce the medical colleges to greatly advance their requirements for a diploma? Since, to solve this question, the law is not now applied to, but the influence of the profession on, and the voluntary action of the colleges, these efforts are outside of the domain of State medicine. But it is to be feared that, however commendable these may be, they will not prove sufficiently successful to arrest earnest efforts to deprive every medical faculty of its legal authority to determine *when* its students are adequately qualified, restricting every faculty to the legitimate duty of furnishing ample means to become qualified.

As a factor in the progress of public hygiene there is no subject more fundamental and important than the registration of

vital statistics. The history of State legislation abundantly proves that trustworthy reports cannot be obtained from voluntary action, even of medical men; that an adequate penalty must, in case of negligence, be enforced on all from whom the law may require reports; that a competent paid medical official to receive and compile the reports is indispensable; and that the difficulties in establishing an efficient system of registration in our States are so great that, although many have enacted laws, these have failed to yield results of any worth, except perhaps in one or two States, and in a somewhat larger number of great cities. Since these difficulties spring in large measure from inappreciation of the subject by the people, effort should be constantly made to enlighten public opinion. For this purpose it is very important that the medical profession should familiarize itself with arguments to convince the public of the extreme value of vital statistics, not only in reference to the rights of property and other judicial requirements, but also in reference to their infinitely greater value for sanitary purposes.

Public hygiene derived its birth from and depends for its future progress on vital statistics, and every argument which favors the establishment of boards of health is an argument in behalf of vital statistics, for, while a board of health without them is as helpless as is a man without eyes to guide him, so without vital statistics the public is destitute of the only valid test of the value of a board of health. If a human being is much more valuable to the State than is a bale of cotton, then statistics of the human crop would prove much more valuable than statistics of the cotton crop, and yet every newspaper can and does furnish statistics as to the cotton crop, such as no man can now anywhere procure as to our human crop. Vital statistics furnish unerring lessons as to the health, prosperity, and morals of the people; they teach the influence of marriage on illegitimacy and morality; the fecundity of the whole people and of the races thereof; the vital force of the children; the duration of life, with its expectation and value, for all ages and races; the influence of meteorology, occupation, locality, in generating disease and improving health, and thereby the removal of unfavorable conditions, always found, even where least suspected; and the approach of morbid storms, by ignorance of which negligent cities and even nations have been destroyed. The only foundation of life insurance, vital statistics serve alike to guide the resident and the immigrant, the capitalist and the laborer, the

politician and the statesman, the moralist and the scientist. Ignored or disparaged by the average American State legislator, they have been advocated and supported by Napoleon and Thiers, by Bismarck and Cavour, by Gladstone and Disraeli; and their establishment has become a test of the degree of civilization reached by a people and their rulers.

Having attempted to define, illustrate, and briefly enforce the importance of every one of the four branches of State Medicine, attention is now invited to the last question to be discussed, which is: What can this Association do to enlighten and more efficiently organize its branches, the State Medical Societies, to the end that the *practice* of State Medicine may be thereby promoted? But before entering upon the main question it will be well to prove what can be accomplished by an enlightened and efficiently organized medical profession.

What *has been* effected by the 20,000 physicians of Great Britain will serve to prove what *might be* effected by the 60,000 physicians of these United States; and because of like language, laws, and institutions, the successive steps by which Great Britain has made its noted progress in State Medicine are worthy of our special study, since through like progressive steps must we advance. In 1832, 310 physicians founded the British Medical Association, which, extending now its arms by thirty-one branch associations into every part of the three kingdoms, numbers more than 7000 members; and, though these pay an annual fee of only \$5, the revenue of the Association amounts to \$50,000.¹ What power has it gained over, and what benefits has it conferred on the profession and on the public?

It has promoted friendly intercourse, and thereby strengthened the links binding the units to the mass; it has gained immense control over medical ethics, and thereby established a high standard of professional conduct, and greatly increased both its

¹ The British Medical Association was incorporated in 1874. Its affairs are managed by a "General Council," composed of one delegate for every twenty members, and the authority of this council is in large degree delegated to twenty members, who compose the "Committee of Council," which meets not less than four times a year. The *British Medical Journal* (pp. 645-6, April 26, 1879) publishes the annual financial statement of the Association for the year 1878, and reports the total receipts during the year, for said year alone, about \$65,000; of which about \$40,000 were received from 8000 subscribers to its Journal, and about \$20,000 from advertisements in said Journal. Of the \$65,000, about \$40,000 were expended on the Journal, and of this \$40,000, about \$4000 were paid the editor and one assistant editor, and \$6000 were paid to contributors.

social and political influence; it has fostered scientific debate, as also greater accuracy in clinical and all medical studies; in addition it appropriates some \$2000 yearly for promoting original researches, which exalting the profession have blessed humanity, and thereby it has vastly stimulated the progress of medical science. It has raised by voluntary subscription a "benevolent fund," which yields more than \$3000 annually, and thereby it constantly contributes "temporary relief to distressed medical men, their widows and orphans." It did establish in 1853, when it had only 1850 members, and it did very greatly improve in 1866, when it had only 2400 members, its weekly official organ, that noted first class periodical the *British Medical Journal*, and thereby it has constantly instructed and stimulated its members—furnishing this valuable journal without cost—has increased its membership since 1866 at the rate of 500 annually, and has added a large surplus to the revenue derived from the annual fee of its members. But, great as are these benefits to the profession, they are insignificant when compared with those conferred on the public.

Pari passu with the progress of the British Medical Association, medical and sanitary measures have been forced, by its "Parliamentary Bills Committee," upon the attention of Parliament, and are now receiving from this enlightened body more consideration and wiser action than given by any other national legislature. Parliament, influenced by the British Medical Association, has, by law, greatly improved the status and efficiency of the medical officers of the army, navy, and "Poor Law Medical Service;" has, by the Registration Act of 1858, greatly repressed charlatanism, and has notably stimulated medical education, not only by this means, but also by establishing boards independent of medical teachers to examine and grant diplomas;¹ and has by the four different Acts of 1853, '61, '67 and '71 forced "compulsory vaccination" on all infants over three months old, thus obviating the popular Anglo-American outcry against invasions of the "personal liberty of the subject." But, surpassing in importance all these and other unmentioned laws, are the six public health Acts,² enacted from 1848 to 1875, which have

¹ See Address on "Higher Medical Education," etc., by Dr. Wm. Pepper, Philadelphia, 1877.

² The Public Health Act of 1848, the Nuisances Removal Act of 1855, the Local Government Act of 1858, the Sanitary Act of 1866, the Public Health Act of 1872, and the Public Health Act of August 21, 1875.

established on a solid foundation an efficient system of public hygiene, with 15,000 sanitary districts and the requisite number of sanitary officers. These acts have rendered Great Britain pre-eminent in preventive medicine, and have secured to this great nation the preservation of its power and a constant increase to its prosperity. But, as science is ever progressing, so the British Medical Association is constantly finding old structures to demolish, new edifices to erect. Among these it will soon demolish the coroner, build up inebriate asylums and other means to control habitual drunkards, establish compulsory revaccination at puberty, and erect for our envious admiration a few stately "Conjoint Medical Examining Boards," which will secure the people not only qualified physicians but also competent midwives, pharmacists, dentists, and even professional nurses.

With this imperfect statement of what has been and will soon be accomplished by the British Medical Association, attention should be directed to the important advantages it enjoys over our American Medical Association. *First*, the small extent of Great Britain, the density of its population, the cheapness and quickness of travel, all tend greatly to facilitate associated action, as is forcibly illustrated by the influence, on the relative prosperity of our various State Medical Societies, exercised by the number of physicians, the density of population, the number of miles of railroad, and the legislative encouragement given to medical organization in the different States. *Secondly*, the British medical profession has, as to State medicine, the inestimable advantage that it is able to concentrate its whole influence on one supreme legislature—Parliament; while our form of government, since it for the most part reserves to the States those powers on which State medicine depends, forces the American medical profession to fritter away its influence on forty-eight State and Territorial legislatures, which vary in intelligence and in the conditions favorable to the development of State medicine. From this latter difference the following important conclusions, so far as State medicine is concerned, follow: that the American Medical Association is not of so much importance to the medical profession of this country as the British Medical Association is to the medical profession of Great Britain; but, that our thirty-seven State medical societies are far more important to the profession of each State than the thirty-one British branch associations are to the profession located in as many different sections of Great Britain, and further, that this comparative superiority

of the State societies and inferiority of the National Association renders it the more incumbent on this Association to strengthen its hold on its branches by enlightening them, and by promoting in all possible ways their efficient organization and their usefulness. Neither this Association nor the State medical societies have seemed to realize these obvious facts, nor to appreciate that their field of greatest usefulness is in promoting the practice of State medicine. For, at the present day, medical science is worked out in the abodes of the sick, in laboratories, museums, libraries, and the results are discussed and disseminated to far greater advantage by innumerable medical publications than is now done by any society; therefore, the usefulness of medical societies is limited in great degree to cultivating professional brotherhood, and to promoting measures needful for the advancement of those branches of medicine (such as the practice of State medicine notably is) which depend for their progress on their advocacy by the united voice of an organized profession. If State medicine be not the paramount interest of a State medical society, then what should be its chief interest, and to whom else would it transfer the interests of State medicine; and, if this be the paramount interest of the branches, what should be the chief interest of their great representative head, the American Medical Association? If these views be correct then it is manifest that the chief labor of this Association should be devoted to instructing, guiding, and strengthening, especially in matters of State medicine, the State medical societies. Thus at last is reached the important final question,—

WHAT CAN THIS ASSOCIATION DO TO ENLIGHTEN AND MORE EFFICIENTLY ORGANIZE ITS OWN BRANCHES—THE STATE MEDICAL SOCIETIES?

What has been done is stated in the appendix, but it will be well to mention in this place the following facts: A committee which had been appointed to confer with the State medical societies reported, in 1870, that it had not been able even to find the addresses of all of them. The Transactions of the past ten years contain no evidence that this Association has a correct knowledge of the titles, addresses, number of members, and like facts, even of its primary branches, much less of their auxiliary county and district societies; in truth, this representative American Medical Association has apparently no knowledge,

except the vaguest, of its own constituents, and apparently has made no attempt to secure such knowledge, unless it is seen fit to so consider the valuable voluntary contribution on the "Statistics of Regular Medical Associations in the United States," by Dr. Toner, to the Transactions of 1873; but this was published the year before this Association became the representative exclusively of State medical societies and their auxiliary branches, no member, except delegates, having the right to vote. In 1878 Drs. N. S. Davis and S. D. Gross, as a special committee, reported that "there is at present no uniformity in the plans of organization of the several State medical societies;" that some of them are merely "annual mass meetings;" and that—comparing these societies with each other—their requisites for membership "are so unequal, changeable, and uncertain," that it was not advisable for this Association to admit, even as non-voting members of itself, the voting members of its own branches. These various defects are not creditable, and deserve earnest effort to rectify them.

What can be done? A standing committee on the more efficient organization of this Association and its branches—perhaps an executive council, such as the British Medical Association entrusts with the general management of its affairs—should be constituted, and charged with the duty of devising ways and means to promote the *uniformity*, as well as the strength of organization, essential to the harmonious and efficient action of many parts united under one head. Among the ways and means tending to enable this Association to gain the authority and to wield the power which the future promises, and the British Medical Association has already secured, the following deserve consideration:—

A model code of detailed regulations, for both State and county societies, should be compiled, published in pamphlet, and recommended for adoption.¹ This compilation would require a thorough study of the constitutions and by-laws of all the State medical societies at least—if not of all their auxiliary branches—in order to select the best regulations of the best so-

¹ More than twenty years ago a committee did recommend for both State and county societies a model skeleton constitution, etc., which were not only meagre and unsatisfactory, but are inaccessible to all except the few who possess the Transactions for 1865. These few are not likely to be found among those who are initiating a medical society.

cieties, and to secure, with as few alterations as possible, efficiency and a reasonable degree of uniformity. Difficulties would be encountered, but none occur to me which would prove unsurmountable, provided that, inside of certain fixed bounds, freedom of choice were permitted. For instance,—while a State society, which fails to recognize that its chief duty is to encourage the organization of county societies, and so far neglects this duty that it makes no provision for the admission of delegates, should not be recognized at all by this Association,—every State society should certainly be permitted to elect whether its voting members shall consist exclusively of delegates, or of a combination of delegates and of permanent members; and, of course, there should be no interference with anything which concerns their non-voting members. A difficulty, only second in importance to the regulation of membership, would be the regulation of the relationship between the State societies and their auxiliary branches,¹ and between these and this Association; however, this difficulty has, in the main, been solved by the existing requirement, that the county societies, to be recognized by this Association, must be *represented* in their State society, that is, must be auxiliary and subordinate thereto; but it is doubtful if this requirement is enforced. Probably no other requirement need be enforced, except that an annual duplicate report of certain specified details should be forwarded, one to the State society, and the other to this Association, for a head which has no knowledge of, and derives no good from its parts, had better get rid of them.

The following facts seem to prove the need of such a model code of regulations: Eleven, or nearly one-fourth of our forty-eight States and Territories, have not yet organized branches to this Association. If uniformity of organization be desirable, and if its promotion be the interest of this Association, then surely this fact alone presents sufficient proof. Farther, a large number, probably a majority, of the present thirty-seven State medical societies are in an immature condition, working under constitutions which were manifestly constructed in haste by a hurried committee which had neither a good model at hand, nor experience in the matter to guide them; and all

¹ The State medical societies of Alabama, Indiana, and Louisiana are the only ones known to me, which have recommended to their auxiliary branches a special code of regulations.

of these societies would no doubt welcome such a model constitution as could be compiled by this Association, and such as would be an improved basis on which to build up an efficient and uniform organization of the whole profession of the United States. Study leads me to believe that of the thirty-seven State medical societies, there are probably only five—those of Alabama, Connecticut, Massachusetts, New Jersey, and New York—which would, in consequence of State laws in their favor, present any serious difficulty in the accomplishment of the end in view; and that if these favoring State laws were specially studied no insurmountable obstacle would be encountered in modelling a constitution which in all essential particulars would be in harmony with them. Still further, it appears, in the statistical table which constitutes the first part of the Appendix to this article, that, in 1878, there were in thirty-seven States and the District of Columbia 2252 counties; that corresponding thereto were only 557 county societies, or rather auxiliary branches of State societies; that these 557 auxiliary societies had about 13,000 members; that the 38 primary societies had about 10,526 members, who for the most part are also members of the auxiliary societies, and hence are in large number duplicated in the 13,000 members thereof; and therefore that the constituents of this Association now number about 15,000, perhaps one-third of the American regular medical profession. Now, the facts that over three-fourths of our counties are yet to organize medical societies, that not more than one-third of the profession is yet organized, and that this one-third is, for the most part, organized most loosely, and bound to this Association by the frailest ties, serve to confirm my conviction of the need for an early and vigorous effort on the part of this Association to promote a more efficient and uniform organization of the whole profession in all the States and Territories.

In addition to providing a code of regulations at an early day, this Association should at once adopt measures to secure for publication in every future volume of its Transactions an annual statistical report of certain specified details from every State medical society. These details should be of such nature as to put an end to the complaint of this Association, of the State medical societies themselves, and of all those who, like myself, have had a tedious and costly experience of the justice of the complaint, that it is very difficult to learn the correct address

of and to communicate with many of the State societies; and these details should embrace the facts needed to show the condition and progress of each society and its branches, and thereby the condition and progress of medical organization throughout the country,—in fine, such details as are presented in the table appended: a table which, though the result of much labor, has many defects, due to the inadequacy of my means to secure better information. Therefore, its presentation would have been deferred, except for the belief that it would illustrate my view, and serve others as a guide to something better. The data in this table, and other instructive facts, could be procured through some member of the Association in each State, until the time when every State society would, as some now do, publish them regularly in its annual Transactions. In addition to reporting these statistical data, a brief report from each society, as to the peculiarities of its regulations and the measures it is using to promote its greater efficiency, would tend to hasten the date when greater uniformity of organization would be secured. Still further, the Section of State Medicine should urge every State society to publish annually in its Transactions, or should adopt measures to secure from every State, an annual report of what has been and is being done in each to promote State medicine; these reports should embrace abstracts of the laws, their special merits and demerits, their execution, proposed amendments, and all other facts necessary for compilation of a consolidated report, which would teach each State what progress is being made by all other States in the practice of State medicine. This Section is as to State medicine the only body which represents the interests of the nation. Is it not a noteworthy fact that the annual published proceedings, neither of the Section on State Medicine nor on Medical Jurisprudence, contain any notice of the important decisions rendered during the past two years by various courts in reference to the compensation of medical experts (see appendix, Indiana)? Is it not astounding that the same charge is true in regard to one of the greatest triumphs in medical jurisprudence ever yet accomplished by any English-speaking people—the total abolishment of the office of coroner by Massachusetts in May, 1877 (see appendix, Massachusetts)? Nor are these the only omissions of interest, as may be seen in the appendix, which was compiled to show some facts as to the organization of State medical societies, but more especially to

show, so far as each society furnished me the means,¹ what has been and is being done by each in behalf of State medicine.

Every practicable measure should be adopted to strengthen the bonds between this Association and its branches. Such would be the result of any proofs given by this Association, that through it the medical profession of the nation noted with interest everything of value accomplished by these branches. The "Medical Society of the State of Pennsylvania" wisely devotes more than one-third of its large and valuable annual volume of Transactions to reports from its county societies. Would not this Association strengthen its branches, and thereby itself, by devoting a part of its Transactions to a brief record of any meritorious work done by these branches? Such records, if judicious, would, by their authority and wider circulation, tend to stimulate the State medical societies and to reform the glaring defects in many of their Transactions;—some of which are published without index, table of contents, list of members, their addresses, or any facts of value concerning the society itself, are destitute of a committee, even of a report, on State medicine, and are filled with articles no first-class journal would publish, and serve no purpose except to advertise, at considerable cost and discredit to the society, that the writers are adepts in some specialty. This Association should teach its branches that they are valued in proportion to their success in organizing county societies, in promoting the practice of State medicine, and in advancing the progress of medical science, for on these things depend the power and usefulness of this Association and of the medical profession.

In 1870, Prof. Gross² urged this Association to replace its annual volume of Transactions with a periodical medical journal. *The British Medical Journal* was founded by the British Medical Association. While it had only 1850 members in 1878, the American Medical Association derived its revenue from 2077 permanent members and 442 delegates; and the experience of the former Association would seem to prove conclusively that, if this Association should adopt Prof. Gross' suggestion, and put "the

¹ For Transactions and other sources of information I am deeply indebted to so many officers and members of State medical societies, that a proper acknowledgment to all my creditors would occupy much space, and I would prefer to avoid an invidious omission of the few who have seemed to know little and to care less about their societies.

² See pp. 30, 31, Transactions 1870; and pp. 129-131, Transactions 1872, where Dr. Theophilus Parvin urged the same change, forcibly and at length.

right man in the right place" to control its journal, no other measure would so promptly and effectually promote the prosperity of this Association. Frequent communication between it and its branches would serve to stimulate medical organization and enlist in its support the whole profession. If such a journal kept in view that its first great object was to efficiently organize the profession, and that this was needed in order to promote the practice of State medicine and to advance the progress of medical science, a great need would be supplied, the heavy annual expense of from \$10,000 to \$15,000 now incurred by State medical societies in publishing their Transactions would be in some measure curtailed, and physicians in large number would be induced, by the greater value of the journal than the amount of the annual fee, to become members of this Association. This measure would, I believe, hasten the fulfilment of Dr. Bowditch's commendable proposal to admit as non-voting members of this Association all voting members of its branches,—a proposal which would, no doubt, be adopted, provided that greater uniformity of membership were secured, and that these members contributed to the support of the Association its annual fee.

As additional methods, calculated to strengthen State medical societies, and to promote medical organization, the following deserve mention. No physician residing in the United States should be elected either a permanent member or a member by invitation, unless a member of a State medical society—provided that such a society, recognized by this Association, exists in his State. No delegates should be admitted from the branches of a State medical society unless their certificates be endorsed by some authorized officer of the State society. Only the voting members of an auxiliary society, who have paid all fees due both to the auxiliary and to the State society, should be either admitted as delegates to this Association, or be enumerated as members entitled to be represented by delegates. Every medical college should be urged to have at least one lecture delivered to every graduating class on the importance to the profession and to the people of medical organization.

In fine, the most important duty of this Association is to devise ways and means to organize the medical profession in county societies, to gather these into State societies, to aggregate the whole into this Association, and to thus induce every

reputable, prosperous, and intelligent physician to contribute, as many now do, annual fees of from \$10 to \$15 to support these three societies. If these results could be achieved (and there can be no doubt that effort should be made to achieve them), it would be difficult to exaggerate the magnitude of the power which, by the dissemination of useful knowledge and other means, this Association would acquire. How vast an influence on the sanitary progress of every State this Association could exercise with a revenue of \$200,000, which it would have if all reputable physicians were members! How great its influence would be with only half this sum, and with few others than volunteers to do its work, leaving the many members who desired to do no more, no more to do than to contribute the annual fee, which would be returned, as is now done by the British Medical Association, in periodical publications more valuable than the amount of the fee! Power always attracts new adherents, and it is probable that this would grow so great, through branches ramifying in every county and State, that all other national medical associations—as those of the Superintendents of Asylums for the Insane, for Idiots and Feeble-minded Children, for Inebriates, and the American Public Health Association—would find that their usefulness could be best promoted by becoming separate Sections of this Association. Very certainly all such public interests as the National Board of Health, Medical Library and Museum, would rest on a support which would not only insure their permanency, but also their constant progress.

In urging measures to promote the prosperity and usefulness of this Association, I have been somewhat oppressed by the consideration, that one who has done as little for this Association, and has as little practical experience in its working as I have, should scarcely venture to proffer advice. But courage has been gained from the facts, that all essential measures urged by me have also been suggested by those who have occupied the distinguished position of President of this Association; that what was impracticable yesterday may be practicable to-day, or become so to-morrow; that this Association has too much wisdom to be led astray by what may be the impatient zeal of a theoretical reformer, and that rays of hope now illuminating the dawn of a brighter day encourage all in efforts to secure for our descendants the healthier and happier lives which

will surely follow the promotion, by an organized profession, of the practice of State medicine.

If I have seemed in any wise to underrate, either what has been done, or those who have contributed thereto, my words have misconveyed my thoughts. In truth, I well know that this Association has, in spite of many obstacles, done great good; and that this nation has no son who deserves more homage than he who founded it, who still fosters it with a wise father's love, and who enhances, in my esteem, the honor in which all hold his name, when—mindful of the heroic lesson, that man can receive no true honor from, but can confer it on, official station—he signs that name, N. S. Davis, Secretary of the Illinois State Medical Society,—“for, of such is the kingdom of” the American medical profession.

APPENDIX.

EXPLANATORY INTRODUCTION TO THE TABLE.

Tables of Medical Societies.—So far as is known to me the only tables of a nature similar to the much fuller one which follows are those by Dr. Toner, pp. 285–333, *Transactions American Medical Association*, 1873, and by Dr. Billings, pp. 344–346, *A Century of American Medicine*, 1776–1876, Philadelphia, 1876. Discrepancies occur between the last two, and in some instances the data given in my Table agree with neither of these; but in such cases I have accepted, in preference to either of the above, the statements published in the Transactions of each society, or the direct report of some officer thereof.

Titles.—Some societies publish one title on its Transactions, and a slightly different one in the Constitution; in such cases I have followed the latter.

Medical Examining Boards and Boards of Health.—The dates indicate when these were organized; and the dates which are inclosed in brackets indicate that such Boards are not controlled by the society, while the dates not so inclosed refer to Boards which are controlled by the society.

Number of Annual Sessions.—These are very differently enumerated by the various societies. Some of them held no sessions during a number of years, and yet count every year from their organization; *e. g.*, the State society of Alabama held no sessions from 1861–68, of New Hampshire none from 1794–99, of New Jersey none from 1775–82, and of Vermont none from 1828–41; yet these and some other societies claim uninterrupted sessions. Some others enumerate no sessions not held, *e. g.*, the American Medical Association, which held no sessions in 1861 and 1862, and the Iowa State Medical Society, which held none in 1862 and 1863. There are still others—as those of California, Kansas, Louisiana, Michigan, Missouri, and Virginia—which, though organized and holding many sessions before the war, enumerate none except those held since their reorganization. The data in the Table correspond with those published by the societies.

Number of volumes of Transactions published.—Dr. Billings's

report has been adopted, except where the society has reported to me differently. There are probably errors in my figures as well as in his, since many of the societies have no records of their ancient publications and are ill informed thereof. Librarians or others interested should know that some few of the societies, as those of Connecticut, Maine, and Massachusetts, publish Transactions annually, yet designate these as only parts of one volume, which often embraces two or more years.

Members.—The figures given are those reported, as are all the other data, for the year ending with the session of 1878, except as to the number of members of the Rhode Island and Vermont societies, which number is for 1877 in the former, and for 1876 in the latter, as both failed to furnish me later information.

Number of Members present at the Annual Session of 1878.—This is reported because to some extent it indicates, when compared with the total number of members, the vigor of the society. This vigor can also be estimated by comparing the total number of members and the fee due by each with the amount of the annual funds collected. This comparison indicates a very weak condition on the part of many societies; and this condition becomes still more apparent when the four columns are studied, which compare the number of medical practitioners and of counties in the State with the number of auxiliary societies and of their members.

Number of Auxiliary Societies and of their Members.—These are among the most important data in the Table, and yet are the least reliable. Many of the State societies do not know, with any certainty, how many branches they have, still less the number of members thereof. Some, as will be seen in the Table, report auxiliary societies, and yet at the same time report that they do not admit delegates. The data given, though defective, are the best which could be obtained by the expenditure of much time and labor.

Statistical Table of the American Medical Association, and its Branches, the State Medical Societies, in 1878.

No.	STATE.	TITLE.	OFFICIAL ADDRESS.	Organized.	Reorganized.	Incorporated.	Medical Examining Board.	Board of Health.	Number of Annual Session.	Number of volumes Transactions published.	MEMBERS.				MEMBERS PRESENT AT ANNUAL SESSION.		Number of Physicians, United States census 1870.	Number of Counties.	Number of Auxiliary Societies, County, District, etc.	Number of Members of Auxiliary Societies.	Initiation Fee.	Annual Fee.	Funds collected for the year.	Balance on hand.	Date of Annual Session, 1879.	
											Delegates.	Members or Fellows, permanent, ordinary, etc.	Honorary or Corresponding.	Invited or Retired.	Total number	Members.										Delegates.
1	United States.....	American Medical Association.	Dr. W. B. Atkinson, Sec'y, 1400 Pine St., Philadelphia.	1847	No	No	No	[1879 U.S.]	29th	29	Yes	2077	No	104	....	84	442	....	....	....	.....	None	\$ 5	\$ 5340	\$ 2446	First Tuesday in May or June.
2	Alabama.....	Medical Association of the State of Alabama.	Dr. T. A. Means, Sec'y, Montgomery.	1848-61	1868	1875?	1877	1875	31st	21	Yes	382	6	....	388	19	19	1,418	68	32	382	None	{ 10 } 5 1	644	....	Second Tuesday in April.
3	Arkansas.....	State Med. Society of Arkansas.	Dr. R. G. Jennings, Sec'y, Little Rock.	1870-75	1875	1875	No	No	3d	3	Yes	243	....	....	243	45	28	1,026	62	25	253	5	5	320	....	May.
4	California.....	Medical Society of the State of California.	Dr. G. G. Tyrell, Sec'y, Sacramento.	1856-61	1870	1870	1876-78	[1870]	8th	8	Yes	241	17	....	258	33	5	1,257	50	9	350?	None	5	938	....	Third Wednesday in April.
5	Colorado.....	Colorado State Medical Society.	Dr. C. C. Lathrop, Sec'y, Denver.	1871	No	1875	No	[1876]	8th	6	No	58	1	....	59	20	....	70	21	5	46	5	4	54	....	Second Tuesday in May.
6	Connecticut... ..	Connecticut Medical Society.	Dr. C. W. Chamberlain, Sec'y, Hartford.	1792	No	{ 1792 } 1834 1870	{ 1792 } 1810	[1878]	87th	22	36	395	29	....	424	41	....	680	8	8	395	None	2	542	....	Fourth Thursday in May.
7	Delaware.....	Delaware State Medical Society.	Dr. G. T. Maxwell, Sec'y, Wilmington (ed. Morning Herald)	1789	No	1789	1822	No	89th	Not reported	No	95	....	....	95	20	....	170	3	None	None	None	1	....	40	Second Tuesday in June.
8	District of Columbia	Medical Society of the District of Columbia.	Dr. C. H. A. Kleinschmidt, Sec'y, Washington.	1817	No	1819	{ 1819 } 1838	[1871]	60th	5	No	117	....	....	117	60	....	326	0	1	.....	1	3	320	63	First Monday in January.
9	Florida.....	Florida Medical Association.	Dr. J. Y. Porter, Sec'y, Key West.	1874	No	No	No	No	5th	3	Yes	47	6	....	53	12	....	248	43	7	Unknown	None	5	149	....	April.
10	Georgia.....	Medical Association of Georgia.	Dr. James B. Baird, Sec'y, Atlanta.	1849	....	No	No	[1875]	29th	22	No	225	No	No	225	108	....	1,537	133	None	None	5	2	632	166	Third Wednesday in April.
11	Illinois.....	Illinois State Medical Society.	Dr. N. S. Davis, Perm. Sec'y, Chicago.	1850	....	No	[1877]	[1877]	28th	25	Yes	352	....	....	352	44	56	4,861	102	44	1,283	....	3	684	....	Third Tuesday in May.
12	Indiana.....	Indiana State Medical Society.	Dr. G. V. Woolen, Sec'y, Indianapolis.	1849	....	Yes	No	No	28th	28	Yes	928	No	No	928	....	127	3,613	93	56	928	None	1	773	....	Third Tuesday in May.
13	Iowa.....	Iowa State Medical Society.	Dr. J. F. Kennedy, Sec'y, Des Moines.	1850	....	1868	No	No	26th	3 vols. 1867-78	Yes	244	Yes	Yes	244	64	47	1,865	100	47	600?	3	2	345	980	Last Wednesday in January and May alternately.
14	Kansas.....	Kansas Medical Society.	Dr. F. D. Morse, Sec'y, Laurence.	1859	1866	1859	1859	No	12th	11	No	82	8	....	90	22	....	906	72	Un known	3	2	88	....	Second Tuesday in May.	
15	Kentucky.....	Kentucky State Medical Society	Dr. Coleman Rodgers, Sec'y, Louisville.	1851	....	No	[1874]	[1878]	28th	21	No	284	8	Yes	292	80	....	2,414	115	8?	Unknown	3	3	399	....	First Tuesday in May.
16	Louisiana.....	Louisiana State Medical Society	Dr. Thomas Layton, Sec'y, New Orleans.	1849-56	1878	No	No	[1870]	1st	1	Yes	80	Yes	Yes	80	52	....	939	54	3	45	None	5	310	150	Second Tuesday in April.
17	Maine.....	Maine Medical Association.	Dr. Charles O. Hunt, Sec'y, Portland.	1853	....	1855	No	No	26th	Vol. vi. Part 2 6 since 1872	No	266	9	Yes	275	Unk nown	816	16	None	None	3	2	495	398	Second Tuesday in June.	
18	Maryland.....	Medical and Chirurgical Faculty of the State of Maryland.	Dr. J. Gilman, Sec'y, 172 Saratoga St., Baltimore.	1799	....	1799	1799	[1874]	80th	6	Yes	211	3	....	214	142	8	1,257	22	3	Unknown	10	5 & 3	1382	....	Eighth of April.
19	Massachusetts.....	Massachusetts Medical Society.	Dr. C. W. Swan, Sec'y, Boston.	1781	....	1781	1781	[1869]	97th	Vol. xii. No. 4	Yes	1197	14	103	1314	....	104	2,047	14	17	1,300?	None	5	6891	2216	Second Wednesday in June.
20	Michigan.....	Michigan State Medical Society.	Dr. George E. Ranney, Sec'y, Lansing.	1853-60	1866	No	No	[1873]	13th	Vol. vii. No. 2	No	264	4	....	268	147	....	2,034	80	None	None	2	2	281	160	May.
21	Minnesota.....	Minnesota State Medical Society	Dr. C. H. Boardman, Sec'y, St. Paul.	1855	1869	No	No	[1872]	10th	9	No	154	7	....	161	65	....	402	81	None	None	3	2	168	59	Third Tuesday in June.
22	Mississippi.....	Mississippi State Medical Association.	Dr. M. S. Craft, Sec'y, Jackson.	1868	No	No	No	1877	11th	11	No	216	Yes	....	216	57	11	1,511	66	10	Unknown	5	2	379	92	First Wednesday in April.
23	Missouri.....	Medical Association of the State of Missouri.	Dr. A. J. Steele, Sec'y, 2825 Washington Av., St. Louis.	1850-58	1867	No	.....	No	12th	12	Yes	105	16	Yes	121	100	....	3,560	117	7	Unknown	None	3	279	418	Third Tuesday in May.
24	Nebraska.....	Nebraska State Medical Society	Dr. A. S. V. Mansfield, Rec. Sec'y, Ashland.	1869	No	No	No	No	10th	6?	....	80	....	....	80	29	....	247	61	3	Unknown	....	5	200	indebt	First Tuesday in June.
25	Nevada.....	No State Medical Society.	.....	....	....	....	.....	....	....	....	....	....	....	....	....	....	....	[110	17]	....	.....	....	....	....	....	....
26	New Hampshire....	New Hampshire Med. Society.	Dr. G. P. Conn, Sec'y, Concord.	1791	....	{ 1791 } 1816	{ 1791 } 1875	No	88th	25 since 1854	No	150	25	12	187	100	....	565	10	4	120?	3	2	258	....	Third Tuesday in June.
27	New Jersey.....	Medical Society of New Jersey.	Dr. Wm. Elmer, Jr., Sec'y, Trenton.	1766	1820	[1816-30]	1830-66 [1806-13] [1830-44] [1857-74]	[1877]	112th	19	98	23	14	....	135	13	72	1,208	21	18	457	....	2	942	396	Fourth Tuesday in May.
28	New York.....	Medical Society of the State of New York.	Dr. C. H. Porter, Sec'y, 55 Eagle St., Albany.	1807	....	1806	[1830-44] [1857-74]	No	72d	36	140	333	79	Yes	552	75	65	6,810	60	60	3,520	5	2	1242	....	First Tuesday in February fixed
29	North Carolina.....	Medical Society of the State of North Carolina.	Dr. L. J. Picot, Sec'y, Littleton.	1849-60	1866	1859	1859	1877	25th	25	Yes	188	7	Yes	195	64	1	1,143	90	6	Unknown	5	1	203	....	Third Tuesday in May.
30	Ohio.....	Ohio State Medical Society.	Dr. J. F. Baldwin, Sec'y, Columbus.	1846	....	....	Yes	No	33d	28	Yes	464	35	....	499	....	32	4,638	88	70	Unknown	....	2	470	92	First Tuesday in June.
31	Oregon.....	Oregon State Medical Society.	Dr. C. C. Strong, Perm. Sec'y, Portland.	1874	....	....	No	No	5th	4	....	73	7	....	80	Unk nown	206	25	3?	Unknown	2	3	263	80	Second Monday in June.	
32	Pennsylvania.....	Medical Society of the State of Pennsylvania.	Dr. W. B. Atkinson, Perm. Sec'y, 1400 Pine St., Philadelphia.	1848	....	No	No	No	29th	12	Yes	645	....	....	645	40	142	4,843	66	47	1,294	....	2	1724	897	Third Wednesday in May.
33	Rhode Island.....	Rhode Island Medical Society.	Dr. C. H. Leonard, 332 Pine St., Providence.	1811	....	1812	1812	[1878]	68th	3	No	156	28	....	184	59	....	260	5	Un known	3	5	....	....	June.	
34	South Carolina.....	South Carolina Medical Association.	Dr. H. D. Fraser, Sec'y, Charleston.	1848-62	1869	1848	No	No	28th	9 since 1869	Yes	115	7	....	122	16	13	789	32	15	Unknown	None	5	310	....	Second Tuesday in April.
35	Tennessee.....	Medical Society of the State of Tennessee.	Dr. J. B. Lindsley, Perm. Sec'y, Nashville.	1830	....	1830	No	[1877]	45th	4	Yes	274	No	No	274	44	65	2,220	85	10	Unknown	None	3	234	30	Second of April.
36	Texas.....	Texas State Med. Association.	Dr. W. A. East, Sec'y, Hallettsville.	1869	No	No	[1873-76]	No	10th	5	Yes	225	No	No	225	50	15	1,906	162	31	361	None	5	630	24	First Tuesday in April.
37	Vermont.....	Vermont State Medical Society.	Dr. S. S. Clark, Sec'y, St. Albans.	1814-28	1841	1813	1813-20-76	No	66th	6	No	239	14	....	253	51	None	569	14	Un known	None	2	2	140	67	October.
38	Virginia.....	Medical Society of Virginia.	Dr. L. B. Edwards, Sec'y, Richmond.	1870	No	1871	No	[1871]	9th	9	No	380	14	No	394	120	None	2,126	99	No records	2	2	636	....	Autumn.	
39	West Virginia.....	Medical Society of the State of West Virginia.	Dr. M. F. Hullihen, Sec'y, Wheeling.	1867	....	No	No	No	11th	10?	No	73	Yes	No	73	34	....	612	53	8	Unknown	5	2	221	259	First Wednesday in June.
40	Wisconsin.....	Wisconsin State Med. Society.	Dr. J. T. Reeve, Sec'y, Appleton.	1842-61	1867	1841-54	No	[1876]	33d	11	Yes	208	3	No	211	67	....	915	61	Un known	5	3	411	128	First Tuesday in May or June.	
																10,526			62,283	2269	557	11,334	There were 11,334 members in 406 of the 557 Societies.			

NOTES ON THE AMERICAN MEDICAL ASSOCIATION AND THE STATE MEDICAL SOCIETIES.

1. UNITED STATES.

American Medical Association.

The American Medical Association was organized in 1847. Other national medical associations are :—

The Association of Medical Superintendents of American Institutions for the Insane, organized in 1844; the Association of Medical Officers of American Institutions for Idiots and Feeble-minded Children, in 1868; the American Association for the Cure of Inebriates, in 1870; and the American Public Health Association, in 1872.

On the subject of State Medicine and State Medical Societies, and the action thereon of the American Medical Association, the following facts have been derived from the Transactions for 1856, and for the ten years 1869–1878,—all to which I have had access.

State Medical Societies—Organization.

In 1856 a committee reported a very meagre and indifferent skeleton constitution and by-laws for the organization of State and county medical societies, and also recommended that meritorious articles, etc., read before county societies should be referred to State societies, and should be referred by these to the American Medical Association for publication.

In 1874 the By-law was adopted, that “The delegates shall receive their appointment from permanently organized State medical societies, and such county and district medical societies as are recognized by representation in their respective State societies, and from the medical departments of the army and navy of the United States.” Previously delegates had been admitted from “permanently organized medical societies, medical colleges, hospitals, lunatic asylums, and other permanently organized medical institutions of good standing in the United States, from the army and navy, and from the American Medical Society of Paris.” Since no members except delegates are allowed to vote, the American Medical Association has since 1874 become a delegated body, representative exclusively of State

medical societies and of their auxiliary local societies, together with four delegates each from the United States army and navy.

Also in 1874, the Committee of Publication was authorized to exchange the Transactions of the American Medical Association for the Transactions of all State medical societies. The President, Dr. J. M. Toner, strenuously urged the importance of the organization of a complete system of State and local medical societies, and stated (pp. 71-2, Transactions 1874) that, "in 1846, when the American Medical Association was formed, there were but about 125 medical societies and institutions of all classes in the United States; at the present time there are over 1200." However, excluding institutions, Dr. Toner reported in 1873 a total of 413 medical societies with over 20,000 active members (pp. 288-9, Transactions 1873).

In 1877 President Bowditch urged that every well-educated physician in good standing with his State medical society should be, by that fact, a member of the American Medical Association, and that the number of delegates should be reduced from one in every ten to one in every twenty or thirty members. This recommendation was reported upon unfavorably in 1878, because of the present great lack of "uniformity in the plans of organization of the several State medical societies," whereby the requisites for membership would be "rendered so unequal in the different States, and withal so changeable and uncertain, as to be of no practical value."

In 1870 a committee, appointed the year before to confer with State medical societies, reported that it had not been able to find the addresses of all of them.

Medical Education.

A number of reports and resolutions, which came to nothing, will not be alluded to.

The Society has two annual prizes of \$100 each.

In 1856 it was recommended by a committee that the censors of a county society should examine on their preliminary education all persons proposing to become medical students; and in 1871 it was resolved that all State societies should be urged to appoint a board of censors to make such examinations, and prohibit members from accepting any medical students unless so examined. The State medical societies of Alabama, Connecticut, Indiana, New York, Pennsylvania, Wisconsin, and perhaps a few other States have adopted this recommendation. The results are not reported.

In 1869 it was resolved that each State medical society be earnestly requested to appoint one or more boards of medical examiners to examine all practitioners, whether graduates or not; and when two-thirds of the State societies shall have complied, the American Medi-

cal Association will refuse to recognize those societies which refuse to comply, and will regard all physicians not so examined as "irregular practitioners" (pp. 35-36, Transactions 1869). Reports on this subject are continued annually until 1872. The Wisconsin State Medical Society is the only one, so far as I have found, which has complied with this earnest request.

Also in 1869 (Transactions, p. 20) it was "resolved that each State medical society be requested to prepare an annual register of all the regular practitioners of medicine in their respective States, giving the names of the colleges in which they may have graduated and date of diploma or license." I have seen no evidence that any society has complied. However, by the influence in large degree of State medical societies, an edition of Butler's "Medical Register and Directory of the United States" was published in 1874, 1876, 1878; and there are now published annual medical registers for New England, for New York, New Jersey, and Connecticut, for Illinois, for Iowa, for Vermont, for Maryland, and perhaps for other States.

In 1869 it was resolved that "the contract system" is contrary to medical ethics, and that those who practise this system should be classed as "irregular practitioners."

In 1876 a doctress was admitted as a delegate from the Illinois State Medical Society.

In 1871 the Association was warmly thanked for its valuable influence in securing from Congress, on March 3, 1871, improved rank for medical officers of the United States navy. In 1873 like efforts were commenced in behalf of army surgeons, and an equally satisfactory result was secured by the congressional Act of June 26, 1876.

In 1870 Prof. S. D. Gross urged the Association to establish a periodical journal as a substitute for its annual volume of Transactions. This recommendation was not adopted.

In 1876 it was resolved that the International delegates of the Association shall continue to advocate *uniformity* of instruments and means of observation among all nations.

In 1878 a committee reported that its continued efforts to induce Congress to publish the Subject-catalogue of the National Medical Library would probably prove successful. Partial success was accomplished in 1879.

Medical Jurisprudence.

In 1870 a committee was appointed to consider means to arrest criminal abortion. In 1872 it was resolved that the courts should appoint a commission of experts to report conclusions in all medico-legal cases.

In 1870 a committee was appointed to report means to prevent the renewal by druggists of the prescriptions of physicians without their consent, and in 1872 it was resolved that a special committee be established on the relation between physicians and druggists (pp. 69, 72, Transactions 1872).¹

Public Hygiene.

In 1870 and 1871 resolutions were adopted in favor of a national quarantine, to replace the present irregular and inefficient local quarantines. In 1878 Congress passed a national quarantine act. In 1871 it was resolved that every medical college should have a professorship of hygiene; that every State legislature should be memorialized to establish a State Board of Health; and that as soon as six such boards should be established efforts should be made to secure a National Board of Health. In 1873, 1875, 1876, and 1877 continued efforts were made looking to the establishment of State Boards and of a National Board of Health. In 1871 only three States² had boards of health; in 1878 nineteen States had them; and, owing largely to the disastrous yellow fever epidemic of 1878, a National Board of Health was established in 1879.

In the Transactions, 1872, occurs for the first time a definition of State Medicine, cited from the General Medical Council of Great Britain. In the same year it was resolved to discourage the abuse of alcoholic stimulants; and a committee was appointed to investigate diseases transmissible from animals to man, and means to arrest such diseases and their transmission.

In 1873 five sections of the Association were established, and among these there were the "Fourth Section, Medical Jurisprudence, Chemistry, and Psychology," and the "Fifth Section, State Medicine and Public Hygiene." Prior to 1873, the subjects of the above two sections had found a place in four different sections. In 1878 a by-law was proposed, which is to be acted on in 1879, to consolidate the above sections four and five into one section.

In 1878 a committee was appointed to urge the Chief of the United States Signal Bureau to make observations on ozone; and it was resolved that one or more physicians should be on every board of education, etc., to have a voice in the construction and location of

¹ Among other evils, the unchecked repetition by druggists of physicians' prescriptions has aided to promote opium and chloral drunkenness. Germany and Austria are, so far as I know, the only countries which have laws to regulate this matter.

² In 1871 Congress enacted a law for a board of health in the District of Columbia.

educational buildings, the age of school children, hours of study, and general management of schools.

To the above record of the action of the American Medical Association may be added the action of the United States government in reference to State Medicine.

A quarantine law was enacted in 1799; an act for the registration of vital statistics on the log-book of every vessel, in 1872; a national quarantine act April 29th, 1878, which requires, among other things, reports of United States Consuls to the Surgeon-General of United States Marine Hospital service, and weekly reports by said Surgeon-General to all health authorities in the United States; an act in November, 1878, appointing congressional committees and medical experts to investigate and report on contagious and infectious diseases, especially yellow fever; an act establishing a National Board of Health, March 3d, 1879. In addition, the national Congress has enacted laws to regulate the practice of medicine, and to establish a Board of Health in the District of Columbia.

2. ALABAMA.

Organization.

This, the most efficient State medical society in the South, dates its success from its Constitution of 1873. It has three classes of members—counsellors, delegates, and members. Counsellors are the foundation of the Society. They alone can be officers; they cannot be delegates; they cannot exceed one hundred in number, and are elected by counsellors and delegates. They pay \$10 each yearly, and serve for life, provided they continue in good standing, pay promptly the \$10 annual fee, and attend one session every three years; failing therein, their names are promptly erased and published.

Delegates. Two are allowed each auxiliary society; each delegate pays \$5, and in addition brings from his society \$1 for each member thereof. Delegates vote and discharge all duties, but cannot be officers.

Members. Every member of a county society is a member of the State Society, and pays \$1 a year to the State Society. They have the right to a seat and to the floor, but can neither vote nor hold office.

A board of ten censors, two elected annually to serve five years, constitute a committee on the organization and general welfare of the society; a court of impeachment for offending members and societies; a committee to examine all annual official accounts; and a Medical Examining Board, as also a State Board of Health for the whole State. The President delivers an "Annual Message" on the welfare

and objects of the society. It recommends and publishes a constitution etc. for county societies, because, since all county societies are subordinate to the State Society, it deems that uniformity of organization is essential for the harmonious action of all under one head. It owes its Constitution and much of its success to Dr. Jerome Cochrane, of Mobile.

State Medicine.

It has adopted as an inflexible principle, "to never, under any circumstances, demand legislative action for the express and exclusive advantage of the medical profession;" to maintain, as a primary object, the purification of the regular profession itself, and, as a secondary object, the suppression of irregulars; and it seems to have appreciated the great necessity there is, that every scientific society should use the greatest caution in attempting to influence legislation on political or personal or class matters, or on matters unsettled in science.

Prior to 1860 this society gave birth to the State Insane Asylum.

No member can receive a student unless he has passed a successful examination on his preliminary education before the Board of Censors of his county.

In 1877 the legislature empowered this society to appoint a State Board and County Boards of Medical Examiners, and granted to these the extraordinary power to regulate exclusively, and regardless of all diplomas, the practice of medicine in Alabama, determining the qualifications necessary therefor, subject to the sole restriction, that those proposing "to practise any *irregular* system of medicine" should be authorized to practise if found qualified in other branches than therapeutics. Penalty for violation of this law, fine and imprisonment. The State Society has reserved to its central board the sole right to grant the diploma of M.D., but any county society can examine and license to practise in said county.

In 1875 the legislature passed an act constituting the State Society a State board of health and of vital statistics, and its auxiliary societies county boards of health. These laws of 1875 and 1877 have rendered the State Society a veritable medical legislature as to medical education and public hygiene, and have so strengthened the society that many county societies have been thereby originated. In 1879 \$3000 were appropriated by the State to carry these laws into execution.

In 1877 the society discountenanced the establishment of a uniform fee bill.

3. ARKANSAS.

A State Medical Association existed from 1870 to 1875, when dis-sension arose and the present association was organized.

In 1873 a law favoring dissection was secured. Futile efforts have been made to secure from the legislature the establishment of an insane asylum, laws to prevent the propagation of contagious and infectious diseases, a board of health, the registration of vital statistics, and a law to regulate the practice of medicine. It is reported that these efforts have proved futile because of the number of quack doctors who are members of the legislature, and because of the fear of the political influence of the still larger number who are not members of the legislature.

4. CALIFORNIA.

The State Medical Society admits doctresses. The legislature in 1876 enacted a law to regulate the practice of medicine, and amended it in 1878. This society, as also the Eclectic Medical Society, and the State Homœopathic Society are all authorized to appoint medical examining boards to examine and license to practise medicine. However, M.D. graduates are required only to submit and prove their diplomas.

In 1870 a Board of Health was established, consisting of seven M.D.'s appointed by the Governor.

5. COLORADO.

Futile efforts have been made for laws to regulate the practice of medicine, and to provide adequate compensation for medical experts.

A Board of Health bill was enacted in 1876; and the Governor appointed on said board one notorious quack.

6. CONNECTICUT.

This society is governed by thirty-six Fellows, who are delegates from the county medical societies of the eight counties in the State. The clerks of these county societies are authorized by legislative charter to collect from members the annual dues by summary legal process.

In 1792 and 1810 this society was authorized by the legislature to examine and license. In 1848 the same authority was given to the Botanico-Medical Society, in 1855 to the Eclectic Medical Association, and in 1864 to the Homœopathic Medical Society. Hence, at present there are practically "no legal restrictions whatever, and Connecticut is the paradise of the medical tramp;" and the society discourages the exercise of its power to examine and license, because none apply

except non-graduates in medicine, and to license these is an injustice to graduates.

This society has by law an equal voice with the authorities of Yale College in nominating medical professors, and in examining students for the M.D. degree. It is complained that in 1876 a candidate for the M.D. degree was rejected, and that within one month thereafter his name was published among the graduates of the Jefferson Medical College, Philadelphia. The society selects gratuitous medical students for medical education at Yale College, which in 1876 inaugurated written examinations for the M.D. degree.

In 1876 it was resolved that no member of the society should receive any person as a medical student until he had passed a successful examination on his preliminary education before a Board of Censors.

Efforts are being made for a new law to regulate the practice of medicine.

The society has had since 1823 authority to nominate the physician for the Retreat for the Insane. In 1876 a committee reported on a proposed inebriate asylum.

In 1878 a Board of Health bill was enacted appropriating \$3000 annually; it is composed of six members (at least three M.D.'s and one lawyer), appointed by the Governor for six years; the Board of Health is the supervisor of Vital Statistics. The society has arranged for lectures throughout the State on Public Hygiene.

The society has adopted resolutions denouncing prescribing by druggists.

In Connecticut, vaccination can be made compulsory by the "*selectmen*" of a town.

There is published an annual "Medical Register of New York, New Jersey, and Connecticut," also a "Medical Register for New England."

7. DELAWARE.

The law regulating the practice of medicine is "a dead letter." Since 1876 futile efforts have been made for a Board of Health and of Vital Statistics.

[Delaware established a Board of Health in 1879, to consist of seven members of the State Medical Society selected by the Governor.]

8. DISTRICT OF COLUMBIA.

In 1819 and 1838 this society was authorized by law to examine and license all practitioners in the district, *except* those graduated by a respectable college, or legalized Board of Medical Examiners. Of the \$320 annual funds of 1878, \$140 were received for licenses at \$10 each.

In 1871 a Board of Health was established, and in 1874 the Registration of Vital Statistics.

All of these laws are of interest for comparing the results of national with State legislation.

9. FLORIDA.

In 1877 forty-seven delinquent members owed the society \$220. Unsuccessful efforts have been made to obtain laws to secure a charter of incorporation; to render physicians' fees privileged claims; to establish a Board of Health, and a Board of Medical Examiners to regulate the practice of medicine. The present law regulating practice is an old and very objectionable one, which authorizes any two physicians to license any one to practise.

A uniform fee bill was reported upon unfavorably.

10. GEORGIA.

In 1878 the society dropped over 300 of its 547 members for non-payment of the annual fee. There is only one class of members—permanent.

About 1875 a law was enacted to punish foeticide. Complaint is made that the laws as to vaccination are indefinite and inadequate.

Unsuccessful efforts have been made for an inebriate asylum, for proper care of the insane, for removal of the "onerous and unjust special tax imposed on physicians," for proper compensation of medical experts, and for an appropriation adequate to render the Board of Health efficient.

In 1875 was established a Board of Health and of Vital Statistics, consisting of nine physicians appointed by the Governor. Only \$1500 were asked for, but not a cent was given. Strenuous efforts were made to execute the law, with the following results.

Physicians were required to report vital statistics to the ordinaries or county clerks, and then to the Board of Health. The physicians were "too ignorant and apathetic" to discharge the duty, the ordinaries too ill paid to work, and the people too well satisfied of the great healthfulness of their localities to take any interest in the execution of the law. In 1876 the \$10 penalty for neglect to report was repealed, and the law has proved a farce both in letter and in execution.

The law requires grand juries to appoint local county boards of health. Out of 133 counties this law was obeyed in only 21 counties.

In 1877 the board, which was apparently a good one, reported that it was "unwilling to remain longer mere supplicants for existence, criticized for inefficiency in discharging duties, and deprived of legal power to discharge said duties." It is reported that this board of

health bill "from its inception met with most bitter and unreasonable opposition"—that the people did not appreciate it—that legislation in advance of public opinion is dangerous—that it is threatened with repeal—and that its promoters are disheartened and *disgusted*.

11. ILLINOIS.

This society admits doctresses. During 1876 and 1877 the average membership was 253, and the average annual funds collected only \$349 although the annual fee was \$3. In 1878 only 170 of 374 members had paid their annual fee. Complaint is made that a State medical society should consist solely of delegates, and should have no permanent members, who often never attend, never pay, never do any thing; and that most physicians care nothing for a medical society until sickness, adversity, or a suit for malpractice overtakes them.

Efforts have been made to have physicians' bills for last services regarded as first instead of fifth class claims, and to secure proper compensation for medical experts. By the laws of 1874 no one can be committed as a lunatic except on the order of a court, after the decision of a jury of six, one of whom must be a physician.

In 1877 the legislature passed acts establishing a Board of Health and of Vital Statistics, and rendering said board a Board of Medical Examiners to examine, license, and register all practitioners. \$5000 were appropriated the first year; the board is composed of seven persons appointed by the Governor to serve seven years. The Governor appointed three *regular* physicians, one homœopathist, one eclectic, and two non-professional persons.

In 1878 the board had issued certificates to 4456 M.D.'s, had licensed 136 out of 352 applicants, and driven out of the State about 1100 irregulars. The census of 1870 assigns to Illinois 4861 physicians and surgeons. The law requires that all physicians shall be registered, and all must be licensed by the board *except* M.D. graduates. Itinerant sellers of drugs must pay a license of \$100 per month. Penalties, fine of \$50 to \$500, and jail for 40 to 365 days.

There is published an annual "Illinois State Medical Register."

12. INDIANA.

This society admits doctresses. In 1875, when it had 474 permanent members, it abolished these, becoming exclusively representative, and permits none to vote except delegates, one for every five members of auxiliary county societies. Every member of a county society is a member of the State society, which recommends and publishes a constitution etc. for county societies.

It is reported that the Thomsonians succeeded in having an old

law repealed by which the practice of medicine was regulated by the State Medical Society; that at present, in accordance with the law, he who says he is, is a physician; and that, notwithstanding this, Rush County has not in it one irregular practitioner, so strong and harmonious is its medical society. In 1872 the State society resolved that no member should accept an applicant as a medical student unless he had passed a successful examination in his preliminary education.

It is reported that nineteen years' efforts to influence legislation have invariably failed; and that the people must be publicly addressed and thus enlightened in State medicine. The society has a committee of three on State legislation in each county, and has issued to legislators, public teachers, etc., extra copies of excellent articles in the annual Transactions on State medicine.

Laws are needed as to dissection, inebriate asylum and alcoholism, foeticide, poisons, coroners, unwholesome trades and traffic, board of health, registration of vital statistics, regulating practice of medicine and pharmacy.

It is reported that nothing has been done for State medicine, except to make provision for mutes, for the blind, and most inefficiently for the insane, of whom "many are in jails and in loathsome county poor-houses." There are laws to protect animals from the Texas cattle disease; fish from poisoning by *cocculus Indicus*; sheep from other sheep afflicted with contagious diseases; and hogs from hog-cholera.

The question whether a court can force a medical expert to testify without securing him adequate compensation, has in recent years excited so much interest that medical societies have even resolved to raise the issue and force the courts to a decision. This was done in Indiana, and the following facts are pertinent to this question: English courts have decided that a scientific expert need not attend a subpoena, that his testimony cannot be forced, and that he must be compensated. In 1877 the Supreme Court of Alabama decided to the contrary; but, also in 1877, a circuit court of West Virginia concurred in the English view; in 1878 Judge Clark, in the case of "*The State of Texas vs. Jasper Weathers*," decided that he "knew of no law to force a physician to attend court and testify as an expert without compensation;" and, also in 1878, the Supreme Court of Indiana, reversing the decision of a lower court, maintained the expert's right to compensation. The Iowa Code of 1873 (and probably the laws of some other States) wisely provides, that "witnesses called to testify only to an opinion founded on special study or experience in any branch of science, or to make scientific or professional examinations and to state the results thereof, shall receive additional compensation,

to be fixed by the court, with reference to the value of the time employed, and the degree of learning or skill required." This law grants all the medical profession demands.

Excellent articles on this subject are to be found in the Transactions of the Indiana State Medical Society for 1877 and 1878, "The Medical Witness," by Dr. W. Hobbs; in the Transactions of the Medical and Chirurgical Faculty of Maryland, 1877, by Dr. Chris. Johnston, President's Address; in the Transactions of the New Hampshire Medical Society for 1878, by Dr. E. E. Graves; and in the Ohio Medical and Surgical Journal, "The Medical Expert," by Prof. W. J. Conklin, of Dayton, Ohio.

[Indiana, in 1879, enacted a law regulating the practice of medicine through medical examining boards, to be appointed by *any* State medical societies.]

13. IOWA.

This society admits doctresses. State medical institutions as well as societies are allowed delegates. The Committee on Publication can omit any part of an article published. Of 244 permanent members, 29 forfeited membership by three years' arrears in paying the annual fee. In 1876 the President, Dr. Peck, offered an annual prize of \$100. The "Medical Laws of Iowa" are published in the Transactions of 1878.

Fruitless efforts have been made for five years to obtain laws regulating the practice of medicine—for, in Iowa, he is a doctor who calls himself a doctor. Some towns have put an effectual end to medical tramps by enacting an ordinance imposing on each a fine of from \$5 to \$10 a day. Fruitless efforts have also been made for laws giving to the State Medical Society the nomination of medical officers of the Insane Asylum, and of medical professors in the State University. In 1878 the society protested against the diversion of State funds from primary to medical education, apparently because the legislature appropriated \$4100 to establish two homœopathic professorships in the University. The society also protested against the practice of "contract physicians."

Persistent efforts for a Board of Health and of Vital Statistics have thus far failed.

The society succeeded in 1872 in securing a law for dissection, which had been virtually a penitentiary offence; it has also succeeded in securing laws against "the prevalent Christian vice" of fœticide; for the establishment of an institution for feeble-minded children; an apparently good law as to the sale of poisons; to secure reasonable compensation for medical experts; and for the protection of confidential communications by a patient to his physician.

An Iowa Medical and Surgical Directory is published.

14. KANSAS.

This society admits doctresses. The charter of 1859 authorizes the society to examine and license physicians not graduates in medicine; but, it is reported that "in Kansas the most ignorant pretender may dub himself doctor and practise medicine." Efforts, thus far unsuccessful, have been made for a Board of Health and Vital Statistics, and for a law to regulate the practice of medicine.

The Transactions of 1878 report: "The State of Kansas has passed but one law for the prevention of disease, and that was in the interest of her horned population."

15. KENTUCKY.

The State Society, through the influence of the members of county societies on the legislators from said counties, has secured the following laws: in 1874, regulating the practice of medicine; regulating the sale of medicines and poisons; registration of vital statistics; and in 1878 a Board of Health and Vital Statistics, with an appropriation of \$2500. .

The law regulating the practice of medicine is executed by medical examining boards composed of five graduates appointed by the Governor in every judicial district. Only those who are not graduates are required to be examined, and these not on therapeutics. Penalty, fine and imprisonment. The Governor is reported to have once appointed one member who, when appointed, was not a graduate.

The law regulating the sale of medicines and poisons only applies to towns of 5000 or more inhabitants.

The registration of vital statistics is carried out by reports of physicians and clergymen to the town clerk, who reports to the State Auditor.

The Board of Health is composed of six members, appointed by the Governor for six years. The secretary of the board is the superintendent of vital statistics, under the general direction of the State Auditor. Each county court is required to appoint a local board of health, each to consist of three members, of whom one must be a physician.

A prominent physician of Kentucky, and an earnest advocate of State medicine, reports as to these laws: "These laws do much on *paper*, but *practically nothing* for public health. None of them were drawn as desired by the profession, and none accomplish their object. All are enforced in a slipshod, negligent way. Intelligent citizens, even the county officials, are for the most part ignorant of their existence. As to the registration of vital statistics—of any ten physicians or clergymen, not two would be found who comply with the

law, for the penalty is not enforced; and the Auditor, a non-professional official, has apparently never attempted to utilize the vital statistics."

It has also been reported that in executing the Board of Health law, the Governor appointed but one man out of the six who had a proper conception of the duties involved; that another one of the six was appointed secretary, the only salaried officer; that the secretary employed, for a small bonus, a clerk to discharge his duties; and that no good was expected to be accomplished by the balance of the \$2500 which would be left after paying the salaried officer.

16. LOUISIANA.

The State Medical Society, organized in 1878, initiated efforts: to organize the profession in parish societies; to regulate the practice of medicine; to establish "compulsory vaccination;" to repeal the license tax on physicians; and to constitute a physician's ordinary fees a privileged claim—an effort due in Louisiana and other southern States to the great difficulty of procuring remuneration for medical services rendered to the race recently in slavery. Fees for last services are a privileged claim by law, which is practically of no avail, as the privilege must be recorded.

Louisiana has one general hospital, the Charity Hospital at New Orleans, one Insane Asylum, one Asylum for the Deaf, Dumb, and Blind, and one University with a Medical Department. There is a State Board of Health and of Vital Statistics, which however is really for New Orleans alone. "The authorities of incorporated towns and cities are authorized to enact ordinances to protect them from the introduction of contagious and epidemical diseases." (Sec. 2452 Rev'd Statutes, 1870.) It is made the duty of Parish Recorders to record all births and deaths in the State, but (Sec. 344 Rev'd Statutes, 1870), "no person out of the Parish of Orleans (*i. e.* New Orleans) shall be under any legal obligation to have a birth or death recorded." The result is, of course, no records, or records utterly useless for vital statistics.

Section 650 of Rev'd Statutes, 1870, declares "that it shall not be necessary that [the coroner] shall have had a medical or surgical education, or have been a regular practitioner of either branch of science;" and Section 672 wisely requires the coroners to present to the General Assembly an annual statistical report, which the public has never been permitted to see.

Pharmacy is regulated to the extent that no apothecary or retail druggist can be licensed unless "he shall have a diploma of some

medical or pharmaceutical society" and pays thirty dollars annually for his license. This law has done some good.

The practice of medicine is regulated to the extent that by *law* no one can practise unless he has "received the degree of Doctor of Medicine from a regularly incorporated medical institution in America or Europe;" has received one copy of a certificate of this fact, sworn to by himself before a justice of the peace, who must forward a duplicate certificate to the Parish Recorder, who must register it in a special book. The tax collector can then issue a license on the payment of twenty dollars, which he is so pleased to get that he issues the license without annoying himself further as to the requirements of the law. In addition, Louisiana has a law which condemns to the State Penitentiary, for from six months to five years, any practitioners who pretend to possess medical titles to which they are not entitled. None the less, an official report to the Orleans Parish Medical Society reported, in 1879, that out of a total of 270 practitioners in New Orleans, 93 were irregulars or quacks.¹

The Louisiana State Medical Society has petitioned the Convention of 1879 to introduce into the new Constitution of the State the following, which indicate to some extent the needs of the State:—

"TITLE—STATE MEDICINE.

ART.—The Legislature shall provide for the interests of State Medicine in all its departments; for public hygiene or preventive medicine; for medical education; for institutions for the sick and infirm, and for medical jurisprudence; for the establishment and maintenance of a State Board of Health and Vital Statistics for the whole State, with parish or municipal boards subordinate thereto; for the protection of the people from all contagious and infectious diseases, and from all preventable causes of disease and death; for the protection of the people from unqualified practitioners of medicine, surgery, midwifery, pharmacy, and dentistry; for the maintenance of the University of Louisiana, and its three departments of literature, medicine, and law; for the care, education and maintenance of the destitute, sick and afflicted, of the blind, of mutes, of idiots and feeble-minded children, of the insane and of inebriates, in hospitals or asylums, constructed with proper regard to health as well as comfort and the interests of morality, such institutions being rendered as nearly self-supporting as is consistent with the purposes of their creation; for the protection of confidential communications made by patients to physicians; for preventing the advertisement and sale of all fœticial drugs or instruments, and of all drugs detrimental to the interests of health and morality; for the adequate

¹ In 1867 there were reported in the District of Columbia 148 regulars and 85 irregulars and quacks; in 1870, in twelve counties of Minnesota, 119 regulars and 93 irregulars and quacks; and in 1877, in West Virginia, 400 regulars and 240 irregulars and quacks. Adding to these Louisiana, as above, and the total figures are 844 regulars to 511 irregulars and quacks. Of course these figures are only approximations, but they are founded on apparently better data than any other estimates known to me.

compensation of scientific experts in all cases; for the separate trial of criminals alleged to be insane on each issue—first that of insanity—and that adequate time and opportunity shall be given to medical experts to test the question of insanity. No persons shall be allowed to testify as expert witnesses to matters of scientific opinion, except those recognized as competent experts in such matters by their own profession, as organized under the laws of this State. Only qualified practitioners shall be expert witnesses in the courts to medical facts; the legal duties of coroners shall be assigned exclusively to experts in law, and their medical duties exclusively to experts in medicine.

ADDITIONAL INSTRUCTION TO THE COMMITTEE.

If any article of the Constitution of 1879 provides that privileges, to have effect against third persons, must be recorded, the following proviso should be made:—

Provided, that the fees due physicians and surgeons, the wages of nurses, and the bills of druggists and apothecaries, for professional services rendered, and medicines furnished during the last illness, shall enjoy the privilege conferred by law, even as to third persons, without recordation."

17. MAINE.

This society admits doctresses, and its honorary members are not required to be M.D.'s. It has appointed a committee of three in each county to organize county societies, and a committee of one in each county to report the names etc. of every M.D., irregular, quack, etc. In 1867 the society secured \$500 from the legislature to publish its Transactions, but resolved never to try again.

The Maine Medical School owes its foundation largely to this society, which also established the Maine General Hospital, raising for this purpose \$80,000 by subscriptions, and the State appropriated \$30,000. It appoints a committee to visit the General Hospital—also one to attend the lectures and final examinations at the Maine Medical School and the Portland Medical School. In 1867 the society resolved to establish a pathological museum.

In Maine any one can practise medicine, and any one sue a doctor, without restrictions. Fruitless efforts have been made for a law to regulate the practice of medicine and of pharmacy, based on the English Registration Law. (See pp. 305, 311, Transactions 1866–68.)

In 1869 the society succeeded in procuring an unsatisfactory law for the study of anatomy, and in 1872 an inefficient law for "compulsory vaccination." Fruitless efforts have been made for proper compensation of medical experts, and in behalf of that which is much more important—a better plan for taking expert testimony.

Suits, professedly for malpractice, but really for blackmail, have grown to such an evil, that in 1878 the society "resolved, that, with the existing laws on malpractice, it is unsafe to practise surgery among the poor." Apparently, out of 600 physicians in the State,

125 have been prosecuted. The present laws, it is claimed, encourage the poor to suits for malpractice, and the remedy sought was "bonds compelling the plaintiff, in case of defeat, to pay the taxable costs of the suit." The legislature refused to grant this remedy on the ground that it would be "class legislation." For this bill and the facts, see Transactions of 1878, and especially the excellent article of Dr. Sanger.

It is reported that foeticide is increasing alarmingly in Maine, that there are not less than 2000 cases annually, and that it is "impossible to get an attorney to prosecute or a jury to convict an abortionist."

Maine has laws to protect its game and its fish, and has nominal Town Boards of Health, which amount to little except in incursions of smallpox. Since 1874 the society has been vigorously striving to secure a law for a Board of Health and Vital Statistics, which it will surely obtain eventually, because in 1878 the members were using their personal influence with the public and with legislators, resorting to lectures, newspapers, etc. But thus far the legislature has proved "too indifferent and ignorant" to be moved. About 1876 the society urged on the legislature the argument that, inasmuch as the State paid annually \$4000 bounty on wolves and bears to protect its sheep, its human animals were entitled to similar, even if to less favor, to protect them from such wolves and bears as variola, scarlatina, etc. The legislature replied to this argument by at once repealing the bounty on wolves and bears, withdrawing from its sheep the protection which it refused to its citizens.

In 1878 Dr. Gerrish, in his presidential address, urged, "if a syphilitic persists in marrying, he should be so mutilated that perpetuation of his line would be effectually prevented." And Dr. G. F. French presented a strong article on the "Eradication of Syphilis and Crime by Extirpation of the Procreative Power." Dr. French urges that one in every twenty of the population of the United States is now syphilitic, that syphilis is increasing, is now a ground for divorce, that it should impede marriage, and that castration or spaying of syphilitics, lepers, idiots, and habitual criminals—found guilty of indulging in sexual intercourse—is the only means by which posterity can be protected.

For years I have advocated, in my professional lectures, the adoption of this measure in reference to all persons who would, with certainty, transmit to their progeny the irreparable curse of a corrupt organization. The laws of our pious grandfathers used this penalty to punish evil-doers, who inflicted on society far less evil than do those for whom the resuscitation of this penalty is now advocated.

18. MARYLAND.

The Medical and Chirurgical Faculty of Maryland, organized in 1799, is the oldest State Medical Society in the United States except those of New Jersey (1766), Massachusetts (1781), Delaware (1789), New Hampshire (1791), and Connecticut (1792).

In a languishing condition in recent years, it was revived about 1872. It owns a house valued at about \$5700, and furniture, with library, about \$5200. Its library consists of over 2300 bound, and over 700 unbound volumes. It has a salaried librarian, and appropriates from \$300 to \$500 of its average \$1400 annual income to the support of its library. It selects a distinguished orator, whether within or without the State, to deliver an annual oration. It has established a uniform fee table.

This society has made efforts to establish the *practice* of the Metric System; to encourage the publication of the Subject Catalogue of the National Medical Library; to secure laws such as Iowa, Missouri, Michigan, New York, and Wisconsin have to protect confidential communications made by patients to physicians (see p 68, Transactions 1878); and to encourage the publication of a Maryland Medical Register, which was accomplished in 1879.

Since 1799 this society has been authorized to examine and license, a law which, though never repealed, was practically annulled by a law of 1838 in favor of Thomsonians. In 1867 a law was enacted to protect the public against medical impostors and abortionists, but this law proved inoperative because of a defect in the enacting clause—a defect which thus far the legislature has refused to rectify.

In 1874 Maryland established a State Board of Health similar to that established in Minnesota in 1872, consisting of five physicians appointed by the Governor, and appropriating \$1500.

Maryland has laws, as have Massachusetts, Minnesota, and Pennsylvania, prohibiting the *advertising* of foeticidal drugs, etc., as well as the practice of foeticide.

19. MASSACHUSETTS.

Doctresses have not yet been admitted.

This society numbers in its membership more than half of the regular medical profession in the State; has one branch in every county, and more than one in several; derives some \$1400 annually from property valued at \$31,000, in addition to about \$5000 income from annual fees; and manifests its appreciation of the *mens sana in corpore sano* by expending annually about \$1800 on dinner, cigars, etc., and some \$2300 on the publication of mental food. The society is governed by councillors, who are delegates elected annually by the

"district societies," one for every eight members, and who meet four times yearly. The presidents of the seventeen district societies are ex-officio vice-presidents of the State society. An annual prize has given birth to many valuable essays. Efforts are being made for a "Massachusetts Code of Ethics."

At its foundation in 1871, this society was empowered to examine and license, but subsequent laws in this as in other States have so emasculated its original authority, that the cultured and uncultured practitioner are on the same legal level, and charlatanism infests every city and town. Efforts are being made for laws to regulate the practice of medicine, without restrictions as to the therapeutics practised. Efforts are also being made for a revision of the laws as to foeticide.

In not less than six particulars, the influence of this society on State medicine deserves special attention. Massachusetts is surpassed by no other State in the variety and excellence of its public institutions for the sick and the infirm. The Massachusetts General Hospital has probably no equal in this country.

The Harvard Medical College has been among the very first of such institutions to establish a three years' graded course, and is in all other respects one of the very best medical colleges in the United States.

In 1849 Massachusetts effected a very valuable topographical sanitary survey of the State, and is, I believe, the only State which has done this.

Massachusetts has the most satisfactory, however imperfect, Registration of Vital Statistics of any State in the Union.

After thirty years of effort by the medical profession, Massachusetts, in 1869, legislated into existence the first State Board of Health and Vital Statistics organized in the United States. This prolonged effort was no doubt used in conciliating that legal maxim, which declares that "no law can successfully precede its public sanction," and serves to explain, at least in part, the pre-eminent success of this board. However, the Governor did exercise, in the choice of members of the board, an amount of discretion very unusual to politicians, when acting in medical matters; and the legislature, beginning with an experimental appropriation of \$3000 for the first year, has rapidly trebled it. The acknowledged superiority of this board is sufficiently proved by this fact, among many others, that it did at once recognize that the greatest obstacle to sanitary progress was popular ignorance, and therefore that its primary duty was to teach the people. Hence, it at once organized a corps of reliable correspondents throughout the State; it solicits reports from, and issues circulars of information to, all the doctors, preachers, teachers, county and State officials, newspapers and journals in Massachusetts; and, in addition, it

issues and freely distributes more than 10,000 copies of the most valuable Annual Health Report ever published in this country. Thus by enlightening the public it has gained its favor, and has thereby increased its own power and the bounty of the legislature. So great is this power, that it triumphed over a financial combination of fifty slaughter-houses, and converted these health and life destroying nuisances into sanitary blessings; it made war in Boston on the pestilence-breeding "houses of the poor," and thus so alarmed the politicians, who, loving their country much, love votes, even of the sick pauper, more, that the board summoned to its support a mass meeting of the people, and was sustained.

To the Massachusetts Medical Society is also due the greatest triumph yet accomplished in American medical jurisprudence, a triumph which, on this subject, places Massachusetts in advance of every English-speaking people. For, of these all others¹ still maintain that insult to medical, as it is to legal science, the medico-legal office of coroner; who, common sense dictates, should be both a medical and a legal expert, but whom our mediæval laws encourage to be neither.

On October 4, 1876, at a stated meeting of the councillors (delegates) of the Massachusetts Medical Society, it was "voted that a committee of five be appointed to take into consideration the defects of the present laws relative to the appointment and practices of coroners, so far as these defects involve the medical profession, and to report at the next meeting what action, if any, is desirable." At the next meeting, February 7, 1877, this action was strengthened; and at the annual meeting, June 12, 1877, the committee reported that it had "met with speedy and remarkable success." In fact, on May 9, 1877, the Governor had approved "an act to abolish the office of coroner, and to provide for medical examinations and inquests in cases of death by violence." The pith of this law is as follows: While coroners had been required in Massachusetts—as they now are elsewhere—to discharge the incompatible duties of medical examiner and judge—that is, of an expert medical witness and of an expert judge of law—Massachusetts has now divorced this ill-assorted union of centuries; has created the "Medical Examiner" for the performance of one duty, and has transferred the other to the judges of the courts, and has specially enacted that "whether a homicide has been committed or not is a medical question, and whether that homicide be the result of accident, or be justifiable homicide, or manslaughter, or murder, is a legal question."

Thus, laws sanctified by centuries of hereditary prejudice and of

¹ Scotland has never had the office of coroner; the chief duties being discharged in an apparently satisfactory manner by a procurator-fiscal.

barbarous precedent have, in Massachusetts, been at last beheaded by the slaughtering axe of common sense, which emphatically claims that the coroner's medical duties should be assigned exclusively to a competent medical expert, and his legal duties as exclusively to a competent legal expert. Hail! to Massachusetts, which heads the cheerful funeral procession to the coroner's grave; the tombstone should have engraved on one face: *Monstrum horrendum informe, ingens, cui lumen ademptum*; and on the other: "God hath numbered thy kingdom and finished it; thou art weighed in the balance and found wanting; thy kingdom is divided and given to" the doctors and the judges. The results of this novel law, not yet perfected by experience, and already once amended, are more harmonious, successful, and economical than the results of the antiquated laws repealed, and an active Massachusetts Medico-Legal Society has been stimulated into existence.

As no science is more progressive than medicine, so on no men, more than on physicians, is it oftener and more incumbent to "honor him to whom honor is due." Theo. H. Tyndale, Esq., of Boston, is, I am assured, the enlightened operator who, subjecting his patient, the Massachusetts legislature, to judicious preparatory treatment, met with "speedy and remarkable success" in the unprecedented operation of excising this foul tumor from the body politic. If a surgeon, by accident or skill, succeeds in a hitherto unsuccessful operation, the plaudits of the profession reward him, even though the operation be not calculated to confer a fraction of the benefit which will ensue from that operation which, by the advice and aid of the Massachusetts Medical Society, was performed by Mr. Tyndale. That both operation and operator are so little known to and honored by the profession, proves again how little real interest is taken in State medicine. That both may be better appreciated, it should be known that since 1875, if not longer, the British Parliament, prompted by the British Medical Association, has fully recognized the disease, and has agreed to operate, but has not been yet able to decide upon the mode of operation. Mr. Tyndale's method is, however, as eminent for its simplicity as for its success.

20. MICHIGAN.

This society admits doctresses. In 1878 fifty members were dropped for non-payment of annual fee. In 1819 a Territorial medical society was organized and incorporated with power to examine and license. This law met with early and constant opposition, was repealed in 1851, and the society died out. A second State medical society was organized in 1853, but lived only eight sessions. The

present society was organized in 1866. It has made efforts in behalf of an inebriate asylum, and to improve the specifications in the State census.

It has made constant efforts to obtain a law to regulate the practice of medicine, and to register all practitioners; but these efforts have failed because of the apathy of and lack of unity in the profession, and because the supporters of this measure have not had as ample funds for necessary expenses as its opponents have had.

It succeeded in establishing a general hospital and a medical department in the University of Michigan, at Ann Arbor. But in 1875 the legislature established in the same University a homœopathic department, and appropriated \$6000 to support two professorships. Serious and constant trouble has resulted, and advocacy of the doctrine that "a State ought not to establish medical schools, nor support nor govern them."

The society succeeded in 1867 in securing an inefficient law for the registration of vital statistics, a law which has been rendered more satisfactory by subsequent amendments, and has yielded annual reports since 1868 with greatly improved reports since 1877. Experience has proved registration by a non-medical township clerk to be objectionable, and that a paid medical officer is necessary for this duty.

After continued efforts a Board of Health and of Vital Statistics, similar to that of Massachusetts, was established in 1873, and its annual reports since 1874 have been valuable additions to sanitary science.

Although Michigan has apparently excellent laws as to contagious diseases, quarantine, criminal abortion and the advertising of means thereto, food adulterations, nuisances, drainage of swamps, explosive illuminating oils, and is certainly in advance of a majority of the States in the excellence of its "laws relating to public health," yet in 1877 the State Medical Society resolved to discontinue all efforts to fraternize with the Michigan legislature, and Dr. Jerome denounced any further appeals for anything "to the pusillanimous legislature of Michigan," which never lost an opportunity to insult the medical profession and to degrade its members in public estimation.

21. MINNESOTA.

In 1870 this society resolved to organize all practitioners in the State, and in the same year the president offered two prizes of \$50 each. Efforts are being made to organize county societies.

In 1869 an inefficient law was enacted to protect the people from quacks; this was repealed at the next session, and the State has now no laws regulating the practice of medicine.

The society denounces the laxity of life insurance examinations, and demands that the family physician shall be paid by the company for his certificate. An attempt has been made to collect statistics of the medico-legal cases occurring annually in the State.

Unsuccessful efforts have been made for laws to regulate the practice of medicine and of pharmacy; to compensate medical experts; to provide a special jury of M.D.'s for malpractice suits; to establish compulsory vaccination; to arrest the propagation of syphilis; and to secure an appropriation for publishing the annual Transactions of the society. It is urged that, in matters of State medicine, doctors should force legislative candidates to pledge themselves before election.

The society has succeeded in securing laws to punish criminal abortion; to regulate the sale of illuminating oils; to build an inebriate asylum, and to establish a Board of Health and Vital Statistics. This last was established in 1872, with an appropriation of \$250!

22. MISSISSIPPI.

The constitution of this society, as of a number of others, is very defective in not providing for county organizations.

"Counter prescribing" is denounced. Unsuccessful efforts have been made to secure laws to enforce compulsory vaccination, to regulate the sale of explosive illuminating oils, and to establish the registration of vital statistics.

Laws to regulate the practice of medicine are deemed premature, until better appreciated by the people; and attention is called to the fact that a recent report of the Surgeon General shows that of 128 candidates for assistant surgeon, 76 were found unfit to practise medicine and surgery upon United States soldiers, but these 76 M.D.'s are now practising successfully on contented citizens.

In 1877 the society succeeded in having enacted an emasculated board of health law, which is denounced as worthless, and which failed to appropriate for the execution of the law a single cent. It is urged that the people must be taught the money value of sanitary regulations. In 1878 the society contributed \$25 towards the publication of the first annual report of the Mississippi Board of Health.

Mississippi like Missouri, and probably other States, still retains the monstrous and barbarous law which regards the killing of only the unborn "*quick*" child as manslaughter, thus encouraging the popular belief that life does not begin until after the fourth intra-uterine month, and that the slaughter of these innocents is legally justifiable.

23. MISSOURI.

Unsuccessful efforts have been made to establish a board of health, an inebriate asylum, and to amend several "utterly worthless" acts which have been passed to regulate the practice of medicine. It is reported that the State is overrun with quacks.

The city of St. Louis has apparently good ordinances to regulate the practice of medicine, surgery, and midwifery, and to register vital statistics. It had ordinances, which were repealed about 1875, to suppress venereal diseases.

24. NEBRASKA.

Unsuccessful efforts have been made to obtain laws: to charter the society; to require medical inspection of the sanitary condition of all schools; to regulate the practice of medicine and to register all physicians; to establish a hospital for the insane; and to establish a board of health and vital statistics.

This society is reported to be in bad financial condition because of debt incurred in publishing in 1877 its Transactions. It is also reported to have endorsed the advertisements of some of its members, which were deemed to violate the code of ethics; and that as results thereof a number of members abandoned the society, and anticipate forming a new organization.

25. NEVADA.

Nevada has no State medical society.

26. NEW HAMPSHIRE.

This society admits doctresses. It has a fund of \$1100. From 1794 to 1799 it held no sessions, because it could not get a quorum of thirteen, and its Transactions for the first sixty-four years of its existence have been lost.

The society appoints a committee to attend the annual examination of medical students at Dartmouth, where a preliminary examination for admission is required, and a written examination for graduation.

Efforts have been made in favor of the metric system, and to improve the very defective laws as to the insane, especially insane paupers, as to malpractice, and as to the compensation of medical experts. Unsuccessful efforts have also been made to secure a law protecting the confidential communications of a patient to his physician, such as, it is reported, Arkansas, California, Indiana, Iowa, Michigan, Minnesota, Missouri, New York, and Wisconsin have; also to establish a board of health and vital statistics.

At the solicitation of this society the legislature enacted a law,

about 1868, for the registration of vital statistics ;—the law requires physicians to report to town clerks, and these to the secretary of state, but, since the physicians do not appreciate the value of vital statistics, they fail to report, the law is worthless, and has never yielded one single annual report.

In 1869 the society secured a law, like that of Massachusetts, to facilitate dissection.

In 1875 an act was secured to regulate the practice of pharmacy ; and in the same year an act to regulate the practice of medicine, surgery, and midwifery. The last law authorizes every chartered medical society to examine and issue certificates, these to be registered by the county clerk. These certificates can be revoked. All who have M.D. diplomas from “a legally authorized board” are entitled to certificates, without undergoing an examination. It is reported that “this law keeps medical tramps out of the State,” but is in danger of repeal.

27. NEW JERSEY.

This, the oldest State Medical Society in the United States, was organized in 1766, held regular meetings until 1775, then suspended for seven years—until 1782. Incorporated in 1816, it was reorganized in 1820, and again incorporated in 1830. In 1866 an act was passed repealing all other acts, and enacted that this society should be composed of delegates from each district or county society (three from each at large, and one additional delegate for every ten members), and of ex-presidents of the society.

The act of 1866 also authorizes the society to confer the degree of M.D. under such rules and regulations as it may adopt, etc. etc. The extent to which this authority may be impaired by other laws, and the practical value of this act in regulating the practice of medicine, are unknown to me.

This society has a funded property of \$1827 ; it has established a uniform fee-table, invites bishops and the clergy to take seats at its sessions, and its publishing committee is given full discretion as to what shall be published in the annual Transactions.

Congress has been asked to fix a date when only the metric system shall prevail in practice. Unsuccessful efforts have been made “to stem the foeticidal tide ;” to diminish the terrific ravages of syphilis, on the innocent as well as on the guilty ; and to establish an inebriate asylum and diminish inebriety, it being urged, that, though the Maine liquor law has not put an end to drunkenness, it has diminished this vice and also pauperism.

In 1877 laws were enacted to regulate the practice of pharmacy, and also requiring a return of vital statistics to county boards of

health. In the same year a State board of health was established, with an appropriation of \$1000. This board is also required "to make inquiries and reports in reference to diseases affecting animals, and the methods of prevention."

28. NEW YORK.

This society admits doctresses. It consists of a restricted number of permanent members elected from delegates, and of delegates equal in number to the members of the legislature. While in session, every member of the legislature, who is a physician, is invited to attend. For many years its annual volume of Transactions has been the most valuable published by any State medical society. From 1849 to 1872 the Transactions were published by the State legislature, but the appropriation was finally stopped, because, as is alleged, the volume proved to be "a valueless campaign document." In 1809 the society established prizes.

When incorporated in 1806 it was empowered to regulate the practice of medicine, and an act was passed in 1813 to organize auxiliary medical societies throughout the State, with power to enforce on the members the regulations of the society. From 1830 to 1865 various acts were passed favorable to Thomsonians, eclectics, homœopathists, and the practice of medicine by anybody. The present law of 1874 requires that all physicians must be registered, and must be authorized to practise, by an M.D. diploma from a chartered medical school, by a medical examining board, or by a medical society. Every physician in good standing is still required to be a member of a county society, but the penalty for non-compliance has been repealed, and the laws place homœopathists and eclectics on the same footing as regulars. Every county has now by law three medical boards to examine and license, from which result grave abuses and inevitable confusion.

By the influence of this society much has been done to promote State medicine. In 1810 it induced the legislature to purchase for the State a botanical garden. In 1817 it made efforts in behalf of an American Pharmacopœia, and in 1839 in behalf of an American Medical Association, and is the father of both of these. In 1836 it labored for asylums for the insane and for idiots; and after years of effort it succeeded in securing, in 1854, a law legalizing dissection. In 1854 it also succeeded in securing a charter for the first State inebriate asylum ever established. In 1866 it used its influence in favor of the establishment of the Metropolitan Board of Health of New York City, in behalf of which the laws are probably superior to those for any other city or State. Annually since 1871 the legislature has appropriated \$1000 for purely scientific research in the insane asylum at

Utica. In 1876 the legislature initiated a topographical sanitary survey of the State,—such a survey as no other State, it is believed, except Massachusetts, has yet attempted.

Since 1872 no member of the society is permitted to instruct a medical student until he presents a certificate from a board of censors that he has passed a satisfactory examination on his preliminary education.

New York has an excellent law protecting confidential communications of physicians to patients. The society has made efforts, thus far unsuccessful, for laws: to establish a State board of health and of vital statistics, with the registration of prevailing diseases, as well as of deaths, births, and marriages; to enforce compulsory vaccination; to regulate the sale of opium; to furnish proper protection in suits for malpractice; to adequately compensate medical experts; and to establish in the State library a medical department, which should be permitted to lend books, as does the Smithsonian Institute, if proper security be given and express charges be paid.

Every county society has a committee on public hygiene, to report to a similar central committee of the State society.

The instructive fact is reported, that some years since the Buffalo City Medical Society succeeded in diminishing the sale of quack medicines, and at the same time in making the fortunes of several druggists, by resolving to patronize only those druggists who sold pure drugs, and who refused to sell patent or quack medicines.

29. NORTH CAROLINA.

This State had a medical society in 1801, and its board of censors had the power to examine and license. The present society admits doctresses. An act of 1859 authorizes this society to select seven of its members as a board of medical examiners, to license. All practitioners are required by this act to be licensed by this board, registered, and the register published; but no penalty is imposed for violation of this law, except that the violators cannot collect their bills by legal process, and it is specially “provided that no person who shall practise in violation of this act shall be deemed guilty of a misdemeanor.”

In 1877 an act was passed constituting this society a State board of health, and its affiliated societies county boards of health. Responsible, arduous, and expensive duties are imposed on the board, and to aid their execution an appropriation was made of ONE HUNDRED DOLLARS! This extravagance must be shocking to Georgia, Mississippi, and Virginia, which refused to appropriate for their boards of health even one cent! The society is attempting to execute this law,

which it regards as "an insult to the profession," but as a correct criterion of the ignorance of the people and of their representatives.

Information has been received that the society succeeded in securing an improvement of this absurd law in March, 1879.

30. OHIO.

This society admits doctresses. It has a library of about 1300 volumes, it simply *refers* articles for publication to a committee, no member being allowed more than thirty pages of the Annual Transactions; it has a committee on the organization of auxiliary societies. In 1877, out of 605 active members 377 delinquents owed the society \$2228; and in 1878 about one-fourth of the members were dropped for three years' delinquency.

A committee has been appointed to inspect benevolent institutions, and to endeavor to effect that their officers shall not depend for their tenure of office on the fortune of politics.

Effort has been made to consolidate medical colleges where more than one exists in the same city; also to encourage the examination of medical students in preliminary education. Congress has been memorialized in behalf of the Subject-Catalogue of the National Medical Library.

Unsuccessful efforts have been made for proper laws: to establish a board of health and vital statistics; to suppress venereal diseases and prostitution, and empower hospitals to detain those afflicted until free from danger of infection; to regulate suits for malpractice; to provide adequate compensation for medical experts, and a proper method for taking the testimony of medical experts. In 1878 it published 1000 extra copies of the President's address on the "Testimony of Experts," to distribute to members of the legal profession.

Ohio has a law, which I have not procured, to regulate the practice of medicine. Like similar laws in other States, it probably amounts to little.

In 1879 the Governor called attention to the prevalence of grave-robbing, several cases having occurred in 1878 so scandalous as to attract national attention. He recommended a law to put an end to body-snatching by providing an adequate number of dead bodies for purposes of instruction. A bill was introduced in the legislature, and, it is believed, was passed, giving unclaimed bodies dying in public institutions to medical societies for dissection within the State. Heretofore, Ohio doctors have been often sued for malpractice, yet were debarred means to acquire knowledge. The inevitable result was grave robbing. In this case, as in all others, where enlightened progress is barred by legal impediments, the laws are violated; and censure should be attached rather to the stupidity of the law-maker, than to the violator of the law.

31. OREGON.

This society admits doctresses. It is not a delegate body. In 1878 it offered three prizes of \$25 each.

It has a committee which attends the final examinations in the medical department of the Willamette University.

Confidential communications of patient to physician are protected in civil but not in criminal suits.

"In Oregon, as in Virginia and Tennessee, a man becomes a doctor on paying the State license."

Futile efforts have been made in behalf of a board of health; laws to regulate the practice of medicine; to require every practitioner to keep exposed in his office his diploma, or a card stating that he is not a graduate; and to prescribe what text-books shall be used as testimony in suits for malpractice.

There are "poorly constructed laws" as to contagious diseases, but, in spite of the efforts of this society, the legislature has done nothing for it, nor in State medicine for the people.

32. PENNSYLVANIA.

This society has 645 permanent members, who are a part of the 1294 members of its auxiliary county societies; it has worked constantly and successfully to organize county societies, and to bring every physician in the State into a systematic organization of the profession. It publishes annually an excellent "Form of County Reports to the Medical Society of the State of Pennsylvania," and devotes about one-third of its large and excellent annual volume of Transactions (some 500 pages) to the publication of these reports from its county societies. Very valuable materials are thus being gathered for the medical history and sanitary topography of the whole State. It urges the teaching of the metric system in the public schools, its adoption by members of the society, and in 1878 resolved that this system should be used in all future communications to the society.

The society has done much to establish insane asylums, and has resolved that a doctress should be an assistant superintendent in the female department of every insane asylum.

It has also resolved that each county society shall appoint a committee of three to examine on preliminary education all who propose to become medical students; that no member of a county society shall accept a student without a certificate from said committee; that said student must also sign a contract that he will pursue his studies not less than three years; and that members shall recommend their students to attend only those colleges which rigidly enforce in their curriculum a full course of three years.

The legislature has passed no acts favorable to the profession, except an act in 1877 to regulate the practice of medicine and to register all practitioners. This act is so imperfect that it is "really of no value in any way;" however, the society urges all reputable physicians to register voluntarily.

Since 1875 the society has worked unsuccessfully but perseveringly to secure a State board of health and vital statistics, and an appropriation therefor of \$8000 per annum.

It is urged that better laws are needed for the conviction of abortionists.

In opposition to the American Medical Association and many State medical societies, this society was the only one which petitioned Congress *not* to repeal the tariff on quinine,—because of the superior excellence of American quinine, and the necessity for protecting our home-supply.

33. RHODE ISLAND.

This society has the interest on Dr. Fiske's fund of \$2000 for prize essays. It has succeeded in securing unusually good laws, it is alleged, for the examination and registration of pharmacists, and to regulate the sale of poisons. In 1878 it secured a State board of health.

34. SOUTH CAROLINA.

"The Medical Society of South Carolina" was organized in 1789, incorporated in 1794, and authorized to examine and license in 1817; but this society was not a State medical society, as is the present "South Carolina Medical Association." This latter has now a small attendance, and only "a languishing existence," due to professional apathy. Notwithstanding efforts to organize county societies, this society was forced in 1878 to amend its constitution,—which had prohibited the election of any one not a member of a county society,—and to provide that any reputable physician should be eligible, whether a member of a county society or not. The twelve volumes of its Transactions issued before the war are "out of print."

From 1853 to 1861 the State had a system for the registration of vital statistics by tax collectors, but this method "utterly failed."

The society has made unsuccessful efforts to improve the laws as to coroners, who are distinguished in South Carolina only for their ignorance; in which particular this State stands by no means alone.

Congress has been petitioned for laws, "to protect and perpetuate our forests, and regulate the clearing of lands."

In 1878 this society introduced resolutions highly complimentary to Drs. M. and T. G. Simons, of Charleston, for their valuable services to humanity in the yellow fever epidemic of 1877, at Port Royal, S.

C., and at Fernandina, Fla.; and that said resolutions should be published in the daily newspapers. On the strenuous objection of the Drs. Simons, the last part of the resolutions was withdrawn,—conduct which is in such commendable and striking contrast with that of many others that it deserves honorable mention.

35. TENNESSEE.

The Transactions of this society prior to 1875 were published solely in medical journals. County societies regulate “fee-tables.”

The society has made unsuccessful efforts to establish an inebriate asylum, to provide better care for the insane, to improve medical education, and to regulate the practice of medicine and of pharmacy.

It succeeded in inducing the legislature to establish in 1877 a State board of health and vital statistics, which requires every municipality with 5000 or more inhabitants to organize a local board of health. The State board consists of five physicians appointed by the Governor for five years. This bill is described by Dr. Vandeman, of Tennessee, as “in many respects very defective, wanting in some of the most important features,—rough and uncouth.”

36. TEXAS.

This society has made strenuous efforts to organize the medical profession in county societies. It requires county societies to annually report a register of all practitioners of medicine in the county, distinguishing regulars from irregulars. It required every member of a county society to pay an annual fee of \$1 to support the State society, but in 1878 was forced to reduce this fee to *fifty cents*, because of the protest of several of the county societies.

Unsuccessful efforts have been made to induce the legislature to aid the Galveston medical college; to establish an inebriate asylum; to appropriate \$5000 for the culture of the eucalyptus globulus; to require public schools to teach the elements of physiology and hygiene; to make physicians' bills privileged claims; to repeal the license-tax on physicians; to enforce compulsory vaccination; to regulate the practice of pharmacy, the sale of medicines and poisons, and to tax patent medicines; and to enact a law making the society a State board of health and vital statistics, with an appropriation of \$1500 annually. Texas, as other States, has a law authorizing local boards of health, but little good has ever resulted therefrom.

The society aided to induce Congress to place United States medical officers on an equal footing with the officers of other staff departments of the United States army. It made efforts in favor of the national quarantine law of 1878, and the National Board of Health of

1879. It has petitioned Congress to abolish the import duty on quinine; and has endeavored to secure from Congress one set of meteorological instruments for each member of the society.

Effort has also been made to dissuade clergymen and newspapers from encouraging quackery; to induce municipalities to attend to the sanitary construction of houses; to establish a medical journal for the State Medical Society and its affiliated county societies, and to induce its members to refuse to serve as medical experts unless adequately compensated.

This society succeeded in securing in 1873 an act regulating the practice of medicine, and in having this amended in 1876. It addressed the legislature an able memorial on this subject, which is published in the Transactions of 1877. This law requires all practitioners, whether graduates or not, to be examined and licensed by a "Medical Examining Board," of which there is one appointed by every district court, consisting of at least three physicians of known ability. Penalty—violation a misdemeanor, with fine of from \$50 to \$500.

As the Texas constitution provides that, while laws may be passed prescribing the qualifications of practitioners, yet "no preference shall be given by law to any school of medicine," the Medical Examining Boards are prohibited from examining in therapeutics. It is contended that such laws have heretofore failed in the United States because the regular profession has attempted to protect itself too much, to force its ideas of ethics on the people, and that, while laws should require practitioners to be duly qualified to practise, they should be left free to practise what they please.

In some districts trouble has resulted in executing the law because homœopathists have been appointed on the boards by the judges, and the regulars have in some instances refused to serve with them.

37. VERMONT.

This society admits doctresses.

Since 1864 the annual Transactions have been published in one volume for every two to three years, and to this publication the annual receipts, which were formerly devoted to a dinner, are now appropriated. Local societies are not auxiliary to the State society; and in 1876 complaint is made that not two-fifths of the regular physicians in the State are members of the society, that never over 75 and often less than 30 members attend the annual sessions, and that the society is threatened with dissolution from professional apathy.

The president of this society signs the M.D. diplomas of the medical department of the University of Vermont.

The society has used its influence in behalf of a geological survey of the State; a better method of taking the testimony of medical experts; the suppression of criminal abortion, as to which the laws are apparently good, punishing severely favoring advertisements, etc.; the suppression of intemperance; the regulation of the practice of pharmacy, and the sale of poisons; and sanitary reform. It has endeavored to secure an act to authorize the Governor to appoint three sanitary commissioners to examine all sanitary laws and report what laws are needed.

Vermont has a law for the registration of vital statistics; physicians are liable to a fine of \$3 for neglecting to furnish the town clerk with a certificate of every death, but it is not believed that this law ever yielded an annual report.

In 1820 this society secured a law to regulate the practice of medicine, but this law was soon repealed. Another law was obtained in 1876 and amended in 1878; it is similar to the law of New Hampshire, except that midwives are not required to be examined. The chartered societies of homœopathists, eclectics, etc., have the same legal right to examine and license as have the societies of the regular medical profession.

38. VIRGINIA.

Virginia had a State medical society prior to the present one, and before the war. The present society is not a body of delegates. Medical officers of the United States army and navy are specially invited to attend.

In 1872 it was reported that Virginia encourages medical education, condemns malpractice, and yet "virtually forbids dissection."

Efforts have been made to establish an inebriate asylum; to correct "the common and enormous evil" of adulterated drugs; to suppress the sale of quack medicines; to regulate the practice of pharmacy; to provide for the adequate compensation of medical experts; to provide a better system for the registration not only of marriages, births, and deaths, but also of prevailing diseases; to educate the public in preventive medicine; to establish local boards of health; and to enforce compulsory vaccination. Effort was made, but apparently abandoned, to secure an act making physicians' fees a privileged claim. The influence of the society was given to establish a national quarantine, and the National Board of Health.

The society has also used its influence with Congress to secure a law which would enable any man of science to import free of duty one copy for his own use of any scientific book. Futile efforts have been made to secure a law to regulate the practice of medicine, and it is reported that legislators urge, against medical examining boards

composed of regular physicians, that these would be a monopoly, an infringement on individual liberty, and that truth should be content if left free to combat error. It is declared that "humiliating experience has taught us the folly of supinely waiting for legislative cooperation," and it is urged that petitions signed by M.D. constituents should be used to strengthen the timid legislators who fear their constituents.

In 1871 a State Board of Health was secured by a law which requires onerous and expensive duties to be discharged, and enacts that "said board of health shall not in any way be a charge upon the State," and, though effort has been annually made to secure an appropriation, not one cent has been obtained.

It is reported that in Virginia (and this report is true in other States), physicians do not teach the public nor even their patients hygiene, and that sanitary legislation is very often defeated by the doctors themselves.

39. WEST VIRGINIA.

This society has made efforts to organize county societies; to introduce in the public schools instruction in hygiene; to secure laws to enforce compulsory vaccination, and to establish a Board of Health and Vital Statistics. It condemns the "contract system" of practising medicine. In 1877 there were reported to be about 400 regulars, and 240 irregulars and quacks in the State. In 1878 Dr. Hall and the president Dr. McSherry delivered excellent addresses in State medicine, and the society ordered 250 extra copies of the latter to be distributed among the members of the legislature.

It is reported that "West Virginia has exhausted itself in enlightened efforts to preserve and promote the health of its citizens, by appropriating \$75 salary for three vaccine agents, at \$25 per annum for each!"

40. WISCONSIN.

In its earlier days this society was almost destroyed by being a delegated body, by the neglect in organizing local societies; and the neglect of those organized to send delegates. The society now consists entirely of permanent members, for, although it admits delegates, these prefer to become permanent members. Any duty assigned a member, if not discharged at the next annual meeting, must be discharged at the one following, or the member is dropped from the rolls. Every member not assigned to special duty must report at least one case in full, and the details which said report must contain are specified. The society appoints a board of five censors to examine all physicians, whether graduates or not; to examine none

except those who have "sufficient general education," and have studied "medicine three full years"—one in a regularly and properly organized medical college; and unless the examination prove satisfactory the said physician cannot become a member of the society, nor be recognized by the members as a regular physician. This action is in compliance with the resolutions of the American Medical Association, pp. 34-36, Transactions 1869, which declare that, when two-thirds of the State medical societies have adopted them, the Association will refuse to recognize those State societies which neglect to adopt them. Although ten years have elapsed, I have failed to find any other society, except that of Wisconsin, which has adopted those resolutions of 1869.

This board of censors is also required to examine every applicant to become a medical student in at least English and mathematics; and no member of the society is permitted to accept a medical student unless he presents a certificate of proficiency from this board.

This society has attempted to improve the laws as to insanity, as these are unsatisfactory in many particulars. It has endeavored to secure legislation to better provide for the insane and for the blind; to ascertain the number and condition of imbeciles in the State; to provide schools for idiots; to repeal the tariff on quinine; to regulate pharmacy and the sale of poisons; and to register the physicians of the State.

It secured in 1868 a law to promote the study of human anatomy. It reports good but unexecuted laws in regard to criminal abortion, and the fearful prevalence of fœticide; one member asserting in 1870, that no member present would deny that, "where one living child is born into the world, two are done away with by means of criminal abortion."

The society succeeded in securing a State lunatic asylum, and in 1876 a board of health and vital statistics. The board of health receives reports of vital statistics from physicians, a plan which the board finds very unsatisfactory, but urges the continued execution of until the law provides a better method.

It seems that Wisconsin had a law to protect the people from medical tramps, but that this law was repealed in 1870. Efforts have been made to obtain a law to regulate the practice of medicine, but these efforts have not been very strenuous, because of the belief that, if such a law were obtained, it would soon be repealed.

THE NEW PRINCIPLE OF "PROTECTIVE" (PRIVATE) SANITATION IN ITS RELATIONS TO PUBLIC HYGIENE.

By HORATIO R. STORER, M.D.,

NEWPORT, R. I.

At the present session of the Association there will be no subjects presented of more direct and universal interest than those connected with public hygiene. There is growing an intense feeling in the profession that the prevention of disease is much better than its cure, and that even such an epidemic as that of last season ought to have been within control. I may be permitted to contribute a few words to the general sanitary discussion that is certain to take place.

A part of the members of the Section on State Medicine are already aware that within the past year a new element towards the solution of the great general sanitary problem, has for the first time been introduced into this country, and have familiarized themselves in a measure with the practical details of the so-called protective principle. The larger proportion of the Association, however, still know "protection" as merely a vague term, the meaning of which is by no means distinct to them, and are as yet, therefore, unable to judge as to its importance and the potent influence it is soon to exert throughout the United States, so adapted is it to the prevalent modes of thought and action of our people. Such being the case, I am quite sure for the present brief communication, of the patient and favorable consideration of the Section.

For the purpose of preliminarily attracting the attention of the profession, that my more formal statement upon this occasion might have the greater weight, I have elsewhere stated the following facts:—¹

1. That at Newport, Rhode Island,—not merely a fashionable

¹ The Sanitarian, New York, March, 1879, p. 97.

watering place but, for peculiar features of its own, a future health resort, both for summer and winter, of more interest to the general profession than all others upon the Atlantic coast,—certain obstacles to sanitary reform, apparently insuperable by all the usual methods of attack, are now in the way of removal through the influence of a so-called Sanitary Protection Association—a private organization, wholly unconnected with and uncontrolled by local or other politics.

2. That this Association, by its system of thorough and regular inspection of their own premises, aims first at the sanitary protection of its members; and, secondarily, though still very directly, at the general sanitary improvement of the whole city.

3 That it was, so far as can be ascertained, the first instance of such an organization of private citizens for mutual sanitary protection, as well as public sanitary good, as yet formed in America; and, it may be added, there had nowhere among us till then been made the suggestion even that such a plan might be advisable, or could be made effective.

4. That the principle is one that, wherever put into operation, will be sure to be found practicable; and that, above all other members of the community, it is of especial importance, alike for benevolent and for selfish reasons, to all medical men.

5. That, like many another idea that has proved of value to the American medical profession, the first conception of sanitary “protection” was of Scotch origin, and came from within the University of Edinburgh.

6. That the occasion of its adoption at Newport was the fact that, as in many other of our older and more conservative cities, official inertia and love of power weighed so heavily upon the wheels of sanitary progress, that it had proved absolutely impossible otherwise to set them in motion. The appointment of a local board of health—though recommended by a memorial signed by every regular physician in the place—an improved, or indeed any system whatever of public sewerage, the adoption of a water supply for public purposes, the repression of foul cesspools, and of the open removal of night soil, etc., had been successively refused by the Board of Aldermen. Immediately upon learning of the Scotch plan, a Sanitary Protection Association, similar to that just commencing in Edinburgh, was suggested by the writer, and it was quickly established. As a result, and in very great measure through its influence—although it has sedulously ab-

stained from any direct interference with local politics—there were chosen at the late city election (16th April, 1879), a “reform” mayor, and four out of the five aldermen, so that the sanitary changes desired will be quite sure to speedily follow.

7. That it is the aim of the council of the Newport association, composed both of lay and medical members, to do everything within its power towards extending a knowledge of the new principle and its practical working, to other portions of the country. To this end it has already expended a considerable sum of money.

At the close of the communication instances were given of interest to gynæcologists, and also to general practitioners, showing the control possible, through such associations, of widely-existing causes of disease that have hitherto seemed beyond effective reach. The paper alluded to was intended, as has been said, simply to call professional attention to the fact that there exists an idea, of very great practical value to every one of ourselves, to each of our patients, and to every American community, as yet not availed of. In attaining its end, it seems to have been successful. So many have been the inquiries for the Newport plan of organization, and for details concerning the principle and its methods of work, that the writer’s time has been severely taxed. His duty, however, would have been but half performed without the more complete exposition of what sanitary protection really comprehends, that he now attempts to present.

In the paper referred to, extracts were given from letters from prominent sanitarians, in evidence of the way in which the new plan had struck their minds. To these I shall now add but a single one, from a foreigner, who is however known throughout the length and breadth of this country, and who—practical sanitarian of the first rank that he is—has made of what was formerly a filthy and unattractive little Franco-Italian town, one of the most delightful places of invalid resort to be found in the world. Under date of March 23, 1879, Dr. Henry Bennet, of Mentone, acknowledges the Newport pamphlet, and writes to me as follows: “*Your sanitary idea is a great one, and will, I trust, fructify, and do more for hygiene than boards or municipal councils.*”

Sanitary protection originated, as I have said, in Scotland, in the year 1878, and was the conception of Fleeming Jenkin, Professor of Engineering in the University of Edinburgh. His

original article upon the subject was published just a year ago.¹ This was before the Edinburgh Association was formed. Under the presidency of Sir Robert Christison, fifty years ago and ever since one of the greatest of sanitary authorities, the scheme has been made a perfect financial success, the most skilled experts as sanitary engineers affording their services to the members of the association, who now constitute a list of many hundreds, for what to each is merely a nominal fee.

Within a very few weeks, Prof. Fleeming Jenkin has sent to the Newport Association a statement of the results of the Scotch experiment—now such no longer—up to the present time, together with a clear and brief exposition of the plan itself, the credit of which is all his own. It is comprised in three lectures, two of which were given to the Philosophical Institution, and the third to the Medico-Chirurgical Society of Edinburgh.² The remainder of the present communication will consist, mainly, of extracts from Prof. Jenkin's own language, for it can be materially improved upon by no one.

First, however, I will give the working outline of the Newport Association, modelled as it is, with but few alterations and additions, upon that of Edinburgh, since it may be of aid to those of the Section, and I trust the remark will apply to every member of it, who may wish to establish similar organizations in their own neighborhood.

“The objects of this association, based upon that recently found so successful at Edinburgh, and the first of the kind, so far as known, as yet established in this country, are threefold:—

“1. To provide its members, at moderate cost, with such advice and supervision as shall insure the proper sanitary condition of their own dwellings.

“NOTE.—The cost of precisely similar reports to those furnished by the association to its members, would, to private individuals employing the same experts, or others of the same standing in their professions, amount to at least four times the sum.

“2. To enable its members to procure practical advice, on moderate terms, as to the best means of remedying defects in houses of the poorer class in which they are interested.

¹ Edinburgh Medical Journal, April, 1878, p. 865.

² Healthy Homes ; with illustrative diagrams. Edinburgh : David Douglas, 1878. Just as the present paper is completed, a reprint of these lectures, with notes “adapted to American conditions,” by Col. Waring, the consulting engineer of the Newport Association, has been issued by Harper & Brothers, of New York.

“3. To aid in improving the sanitary condition, and consequent good repute, of the city, by following such course as, in the opinion of the council, may seem calculated to promote this object.

“The Association, in reality a mutual insurance company for the preservation of private and public health, is not intended as a substitute for municipal inspection, and will not conflict with the public authorities, but will supplement their action.

“The Association will, however, be in a position to bring to the notice of the public authorities, any infractions of their regulations, which, in the opinion of the council, may call for the adoption of this course. To this end it will receive and patiently consider complaints of sanitary defects or nuisances, public or private, within the city limits.

“Persons become members upon payment of an annual subscription which, for original members, is limited to six dollars for permanent residents of Newport, and ten dollars for those whose houses are closed for a portion of the year; this difference being based upon the fact that premises continuously occupied are more likely to be kept in good order and therefore to require less rigid and expensive examination. Membership shall cease upon failure at any time to pay this annual subscription within three months after it shall have become due.

“At any time after June 1st, 1879, the council shall have the power to increase the annual payment to be made by new members, but they shall not have the power to increase the annual payment to be made by original members.

“Each member shall be entitled to the following privileges in respect of property within the municipality of Newport:

“1. A report by the inspecting engineer of the Association on the sanitary condition of one dwelling or property, with specific recommendations, if necessary, as to the improvement of drainage, water supply, and ventilation; and a report upon the purity of the drinking or cistern water by the chemical analyst. These reports will be obtained upon joining the Association, or as soon thereafter as may be. Should the inspecting engineer consider it necessary for the thoroughness of the examination to employ a laborer for opening wainscotings, lifting floors, digging along the course of a drain, etc., the actual expense of the same will be charged to the member interested.

“NOTE—No obligation will rest on members to carry out the recommendations made to them.

“2. An annual inspection of his premises, with a report as to their sanitary condition.

“NOTE.—No single inspection of any premises will secure permanent efficiency. Methodical inspection from time to time is absolutely necessary as a protec-

tion against inevitable decay, neglect, and accidental disturbance. Examples of failure where design and construction were good are of daily occurrence, and are due to such causes as the gradual stopping of pipes and drains by kitchen grease and rubbish, the corrosion of metal pipes, the fracture of earthenware pipes, the stopping of ventilating openings by dirt, and the pollution, from various sources, of the water supply. The prevention of disease is infinitely better, for the individual and the community, than attempts, too often futile, at its cure.

"3. Occasional supplementary inspection and advice concerning the dwelling or property in respect of which he is a subscriber; as upon the outbreak upon the premises of any serious or suspicious disease, or during the prevalence of an epidemic.

"NOTE.—'It is unfortunate that sewer gases are not more offensive to the senses, as it is only in extreme cases that the leakage can be detected by the smell. Owing to this odorless impregnation of the atmosphere with emanations from the sewers, languor, stupor, headache, nausea, loss of appetite, disturbance of the bowels, and even low fevers caused by sewer gas, often make their appearance in families without arousing a suspicion of their true cause.

"'House drains and waste pipes, to be safe, must at all times be air and water tight and have ample ventilation. Every dwelling should have a distinct and separate sewer connection. This should be properly trapped near the street; should be constructed of iron with tight joints, or of vitrified earthenware or cement with tight joints, not of common mortar, and the bed on which the sewer rests should be thoroughly rammed to prevent subsequent settling of the pipe. The soil pipe, where it enters the sewer, should be properly trapped and securely joined, and should be made of iron with well leaded joints. The waste pipe from the basins, water-closets, sinks and bath tubs should be well trapped. The soil pipe should be extended through the roof, of undiminished diameter, to secure constant ventilation, and prevent siphoning. Specially objectionable are the old fashioned brick drains and leaden soil pipes.' Pipes and drains should always be carefully protected from the frost.

"4. Each member by his annual payment secures the above privileges in respect of one dwelling or property occupied or designated by him. Should he be interested in two or more dwellings or properties, he may secure equal privileges in respect of them all, by paying the annual subscription for each. The council will determine in each case what shall be considered one dwelling or property.

"5. A report, to be obtainable on payment of a special fee of three dollars, on any dwelling or property, or plans thereof, other than that in respect of which he pays an annual subscription.

"NOTE.—This privilege is meant to enable intending occupiers to avail themselves of the services of the Association.

"6. Reports by the officers of the Association as to the sanitary condition of any dwellings or properties of the very poor, on payment by the member requesting it, of a fee of one dollar.

"NOTE.—It is understood that no premises will be inspected unless the occupants themselves consent to the inspection.

“7. A report upon the ventilation, etc., of any school house, church, or other public building, whose sanitary condition, if faulty, may imperil the health of a citizen or member of his family. The expenses of such inspection will be met from the general fund of the Association, and the reports thereof be accessible, upon application, to every member.

“8. A vote in the election of the council who manage the affairs of this Association.”

We are now prepared to examine a little more closely into the practical details of sanitary protection.

“The writer asked permission,” says Prof. Jenkin, “to lay before the Medico-Chirurgical Society the first account of the manner in which it is proposed that the inspection given by the Sanitary Protection Association shall be carried out, because it seemed to him that the medical profession, more than any other, was interested in the establishment and working of this Association. In respect of domestic sanitation, the business of the engineer and that of the medical man overlap; for while it is the duty of the engineer to learn from the doctor what conditions are necessary to secure health, the engineer may, nevertheless, claim in his turn the privilege of assisting in the warfare against disease, by using his professional skill to determine what mechanical and constructive arrangements are best adapted to secure these conditions.

“Let us suppose that the sanitary arrangements in a house have been well designed, and the work well executed; nevertheless, without continual skilled inspection no safety is to be had. The case is analogous to that of the use of a steam-boiler. This boiler may be well designed, well made, and properly used; nevertheless, day by day it decays, and in the course of time must wear out. Then comes explosion and loss of life. This is no fancy picture. Systematic inspection is resorted to by every conscientious user of steam-power, and in their factories it has practically abolished explosions of this class. Now drains, lead and iron pipes, cisterns, valves, traps, and all the sanitary arrangements of a house, are as subject to decay as the steam-boiler. Their decay is more fatal than the rust of the iron boiler-plate, or the wasting away of the boiler stay. For one life lost by boiler explosions, hundreds are lost by the decay and wearing away of our sanitary appliances, and yet systematic inspection of drains and pipes in our houses is to-day almost a novel idea, and a wholly novel practice.

“The decay and failure of drains and pipes is especially dangerous because these are invariably out of sight. The lead or iron pipes are gradually eaten away until large holes admit sewer gas behind the

panelling, and so into our bed-rooms. Yet no greater warning is given than a slight closeness in the room. Drains crack under ground as old or new houses settle, and the sewage pours into the basement. The servants complain of rats and bad smells, but the evil grows so slowly that we are not forced into action on any one day. Cement crumbles away from joints originally well made, and then at the junction perhaps of an expensive leaden pipe with a well laid drain we have a hole big enough to put a hand through, and up through this hole, day and night, sewage gas pours into the house; yet the house is considered remarkably sweet. The ventilating openings carefully provided by the architect or engineer are closed by dirt, by careless or ignorant servants and workmen, or even by birds' nests, and no one is at all the wiser until disease breaks out. Not unfrequently the passage of the sewage through the drains is wholly interrupted by the mere accumulation of kitchen grease or rags; then, while the sewer retains the solid filth, the liquid oozes out at every pore, and yet no harm is suspected. These accidents are samples of ordinary and inevitable decay, even when work has been well designed and well executed. There is but one safeguard, systematic inspection. To insure a healthy house we must not only design the drains and pipes well, see that they are well executed, but we must have them systematically inspected. Now, to do these things requires professional skill, and the one question therefore is, how can the ordinary householder command this skill? Some say that the municipality ought to provide the advice for him, and to some extent this is undoubtedly true. The local authorities ought to require that all plans for sanitary arrangements in new houses should be approved by the burgh engineer. It should also be the work of this official to inspect the execution of the work; but in order that this municipal guarantee may be efficient, it will be necessary both that the standard of excellence commonly required by the town authorities should be considerably raised, and that the staff and powers of the burgh engineers should be greatly enlarged. When, however, we consider a house which is already occupied, the difficulties of municipal inspection become very great, and the right of the occupier to gratuitous services very doubtful. Public authorities must, in the interest of the community, superintend the design and construction of new houses built to be sold, because no one individual has, at the time of their erection, any special interest in these houses, or any right to interfere. But from the moment that the house is occupied, the occupier, so long as he does not injure his neighbors, has a right to arrange the interior of his dwellings as he pleases, and the law would have great difficulty in enforcing good sanitary arrangements simply on the plea of constructive injury to others. Even if the householder demanded the interference of the

municipal authorities gratis, it is rather difficult to see on what plea he could claim engineering advice gratis more than medical advice, or indeed more than good food and warm clothing. The municipal action apparently must cease at the point where the general interest of the community ceases to be paramount, and as a rule this general interest ceases outside of each house-door. At present no one is prepared to recommend that the town shall undertake the duty of annually inspecting every house, and of superintending every alteration in the sanitary arrangements of each house. Nevertheless, without systematic inspection safety cannot be secured, and the question arises, can we by our own action obtain the supervision we require? Thinking over this difficulty the idea naturally occurs that what steam users do for boilers, householders may do in respect of houses. Men can by co-operating do cheaply that which would be costly if each person were to act independently. Let us then have a sanitary protective association. Let each person interested in a dwelling subscribe his annual guinea. With the funds so collected let a staff of competent engineers be engaged. Let each member obtain from the association a report as to the condition of his premises, with an estimate of the cost of any improvements recommended. Then let the member be quite free to carry out the recommendations or not. In any case, let him secure annual inspection of his premises by his annual payment. If the improvements have been made, these annual inspections will secure the permanent efficiency of his arrangements. If he has not chosen to make any improvements, the annual inspection will at least tell him whether things are getting worse.

“The writer will now explain what, in his view as an engineer, are the chief objects of inspection in an ordinary house. In doing so, he must not be understood as exhaustively treating every condition which is known to be desirable, but rather as restricting himself to those vital and practical conditions which can be secured with little expense and no inconvenience.

“1st. It is clearly necessary that each house should be drained, or, more properly speaking, sewered. That is to say, all fecal or other refuse in a liquid form must be conveyed rapidly to a distance from the house; usually they should be taken to the common sewer, but a properly constructed cesspool¹ is admissible as a receptacle for the liquid filth of a house. A very considerable percentage of houses in all large towns are so imperfectly sewered that, while the occupiers believe that filth is being conveyed to the common sewer, in fact it is

¹ “In Edinburgh the word cesspool is often used by plumbers to mean that which in other parts of the country, and in sanitary writings generally, is called a trap.”—JENKIN. “And most of our water-seal traps *are* cesspools.”—WARING.

being deposited by continual leakage in the basements of the houses. The absence of sewerage is due both to defective joint construction, as where ignorant laborers lay pipes sloping the wrong way, or fail to complete the connection between the iron sewer and the house drain, and to subsequent injury, as where the house drain is stopped up by an accumulation of rubbish, or broken by unequal settlements. It is found that, in order to secure the first and paramount condition of health, it is not only necessary that the drains should be properly constructed in the first instance, but that they should be systematically inspected from time to time. Cases are very numerous in which complete stoppage has lasted for years without being suspected by the inmates of the house, although this condition has almost invariably been followed by illness in the house.

“2d. It is very desirable that each house should, as to sewer gas, be thoroughly isolated from its neighbors. This principle of isolation is no less important than that of the rapid removal of the home-made filth. It can be secured by the combination of one or more barriers to the upward passage of germ-bearing air from the common sewer into the house sewer, with an open channel affording what may be termed a safety-valve, so placed that even if the tainted air be forced past a barrier such as that which a common water-trap provides, nevertheless this tainted air shall not enter the house-system, but shall be diverted to a place outside the house where its discharge may be innocuous. The thorough and absolute exclusion of every germ present in the lower sewer from each house sewer is the object here to be aimed at. No system which merely diminishes the number of germs admitted into the house sewer can be regarded as satisfactory. It is necessary from time to time to see that these traps are not clogged, and that, above all, the ventilating opening has not been obstructed through carelessness or ignorance.

“3d. It is necessary that the whole system of piping inside a house should be water-tight and gas-tight. There may be a free passage for sewage out to the common drain, and complete isolation from sewer gas, and, nevertheless, filth, arising inside a house, may leak out into the basement through defective joints or cracks in a pipe, or, in the form of gas, into the dwelling-rooms. To prevent this, we must make sure that the piping is sound, and that wherever an inlet occurs for liquids the exit of gases shall be effectually prevented by properly constructed water-traps.¹ Here, again, originally

¹ “Prof. Jenkin gives less prominence to the house-drainage system, as compared with the public sewers, than we think it demands—probably less than he would himself acknowledge to be demanded were the question put squarely to him. ‘Sewer gas’ is at least as often and as largely a product of the soil-pipe as of the sewer. Prof. Jenkin has followed the custom of most writers on

sound design and construction will not permanently secure the object aimed at. Pipes corrode and break, joints give way with time; moreover, when alterations are made, defective work is not unfrequently introduced. Hence periodical inspection is absolutely necessary to safety.

“4th. It is desirable that the inside of the pipes used to convey foul matters should be thoroughly ventilated or aërated, inasmuch as the presence of large volumes of air tends to prevent that kind of decay which produces noxious gases, and even when these are generated tends to neutralize their noxious character. It is not only desirable that we should by sound pipes and good traps exclude from the house all danger which may arise inside those pipes, but also that we should, so far as possible, prevent the dangerous elements from ever coming into existence. Engineers are in less perfect agreement as to the best mode of ventilating house drains than as to the points hitherto mentioned. To the writer it seems probable that there are many ways in which this object can be effected without great difficulty or expense, and certainly without the use of any patented apparatus. It appears to him as if sanitary reformers, by striving for too much, were defeating their own ends and preventing the public from adopting any ventilation whatever. He is disposed to think that great laxity may be safely permitted in respect of the ventilation of the house drain, provided the cardinal condition is observed that every section between two traps is allowed in some way to communicate with the outer air. Ventilating openings are necessarily subject to be choked with dirt, or closed by carelessness; and, inasmuch as these stoppages lead to no immediate or apparent inconvenience, this stoppage is almost certain to escape detection, unless some inspector methodically examines the passages intended to act as ventilators.

“5th. The water used for dietetic purposes must be preserved clean. To do this, the cistern must be of suitable materials, and placed where no foul air can pass through or over the water. Drinking-water should never be drawn from a cistern used to supply a water-closet or placed in a water-closet; but to enforce this rule would entail so much inconvenience and expense, that, in old houses, the

sanitary subjects, in accepting the plumber's water-seal trap as a satisfactory device. He points out its more glaring defects, but he contents himself with describing how these defects are to be met. He accepts the trap as at worst a necessary evil. This is his only really weak point. The water-seal trap, unaided by some suitable mechanical obstruction—and there is more than one of these in successful use here—is always untrustworthy and an object of suspicion, for water stands in the same relation to gases as that in which sponge stands to water. It may stop a current, but it will not prevent a leak.”—WARING.

engineer may sometimes permit the practice, provided the two special dangers are avoided to which these cisterns are liable. These dangers arise (1) from overflow-pipes directly connected with the soil-pipe; and (2) from badly designed pipes and valves supplying the water-closet. These pipes and valves are sometimes so ill-contrived, that whenever the closet-handle is pulled up a rush of foul air occurs from the pan of the closet through the water of the cistern. When these two gross defects are avoided, the danger of drinking water from the cistern placed over a water-closet is much diminished; nevertheless, in the writer's opinion, in all new houses builders should be compelled to provide separate cisterns for the water required for dietetic purposes; and wherever the owner of an existing house can afford to make the change, it certainly should be made.¹ Inspection of cisterns is very desirable from time to time, in order that any corrosion of lead or accumulation of dirt may be detected. It is also desirable as a means of detecting and checking alterations which are not unfrequently made by ignorant or careless plumbers, with the effect of spoiling arrangements which were originally good.

"In the above summary of the objects to be aimed at in designing the sewerage and water-supply of a house, the writer has endeavored to advance nothing which would not meet the support of the great majority of the engineering profession; he has avoided all controversies as to the relative merits of the dry system and the water-carriage system, or as to the relative merits of various means of carrying out either of these systems. These questions are far too large to be discussed in a single paper; and, moreover, the question which most frequently comes before the medical man is, how to insure that some existing house or an existing town may be made and kept healthy. The writer thinks that by attention to the five cardinal conditions enumerated above, this healthiness may be insured without any great expense, and without the use of any patented apparatus. No doubt there are an immense number of details in the choice of materials, of fittings, and of modes of designing and executing work, all of which are important to some extent; but we are so far from any ideal perfection, that sanitary reformers often ruin their own cause by insisting on an impossible perfection in every detail, by mixing up questions of first-rate and of fifth-rate importance.

¹ As a commentary upon the above, I may state that I nearly lost a member of my own family at Edinburgh, in 1877, from diphtheria from the cause mentioned, and should undoubtedly have done so had it not been for Prof. Grainger Stewart's devoted care. The house, upon Charlotte Square, was one in which I had resided during the greater portion of 1854-55, and is now the best private hotel in the city. The drinking-water had been drawn by servants, though against orders, from a reservoir thus faultily situated, the fact being detected by Prof. Stewart after the elimination of every other possible cause.—H. R. S.

“When, however, the attempt is made to apply these simple principles to any one house, the need of technical or professional advice is at once felt, and hitherto the public have been very much in the hands of plumbers and builders, for architects or engineers are rarely called in, except in the case of mansions of very great importance. The medical man has often to suggest changes in the sewerage of a house as desirable, and he is often qualified very materially to assist the householder in determining what changes require to be made; at the same time, his recommendations are always liable to be thwarted, not only by the apathy of his clients, but by the ignorance or carelessness of the tradesmen employed to design and make the alterations. Moreover, it is hardly to be expected that the medical man shall always be fully qualified either to design or test sanitary appliances. If he is able to do this he does it from pure benevolence, receiving no fee, and often small thanks. Moreover, he must often feel that a responsibility is thrown on his shoulders which he is really not called upon to bear, and which he only assumes because no duly qualified person is to be found who will design and examine these sanitary appliances.

“When considering these difficulties, the writer was led to the conception of an Association which might not only enable its members to obtain the advice and inspection which they require cheaply, but might also induce them to accept advice and inspection which they might otherwise never think of seeking. He saw that it would be possible for an engineer of the highest standing to give advice to a large and important body, whereas it has not been the practice for leading engineers to advise individuals about their house arrangements, except where large outlay was in contemplation. This point in itself is of very considerable importance, just as the leading physician of the day may give his services to great numbers of poor patients when these are gathered in a hospital, although he could not practically visit them in their own houses, so the simple fact of the collection of a number of clients into a group will enable the leading engineer to give them the benefit of his advice. The application of the general principles might be intrusted to younger members of the profession, working under the immediate eye of their chief. On this hint the Association has been formed. Membership is made to depend simply on the payment of one guinea annually. Out of the fund thus provided a leading engineer will be paid as consulting engineer to the Association. The consulting engineer occupies much the same position as the consulting physician. The greater part of the guinea of each member will, however, go to the payment of the executive staff, which will consist of young engineers, each followed by his workmen, who will give their sole services to the Association.

“How the objects named above will be promoted by the action of the Association may best be understood by a slight sketch of the manner in which it is proposed that the work of inspection should be carried out. Each member will, in the course of the year, receive a letter from the secretary, asking whether it will be convenient for him to receive the inspecting engineer on a given day. If the member should not wish to have his house inspected, he will make this known; otherwise, he will appoint a day for the preliminary inspection. During this first inspection the engineer will make a diagram of the pipes throughout the house, and will make every investigation which can be done without entailing any expense to the member. He will then draw up a preliminary report, stating whether a complete inspection can be made without expense to the member, and if not, at what cost the necessary alterations in the fittings can in this particular instance be made. It is not anticipated that in any case the expense of preparing for a complete inspection can be great, but in most cases some trifling expense would have to be incurred. If the member states that he does not wish to incur any expense, he will receive the preliminary report, which will give him all the information concerning the sanitary arrangement of his house, which can be procured by the inspection of the engineer, aided by one workman. If, however, he is disposed to allow a complete inspection, the necessary apparatus will be fixed. This apparatus will usually consist of a (water) trap, with a ventilating grid placed so as not only to give the requisite ventilation, but also so as to allow of the following thorough series of experiments, which will be tried on the occasion of the second visit of the engineer.—1. Is the house drained? This will be tested by simply fastening up the water closet handles for a few minutes, and then watching the flow past the grid at the external trap. It is clear that no obstruction can exist on either side of the trap if this flow is seen to be unimpeded. 2. Is there any leakage from the sewer under the house into the basement? if so, of what magnitude? This will be tested by temporarily plugging up the drain at the trap, and filling the pipe or drain in the basement with water. If the water remains at a constant level the drain is clearly water-tight; if not, the amount of the leakage can be measured by the rate at which the surface falls. No head of water should be put on the drain or pipe, which is usually not designed to resist pressure, but all sewerage pipes passing under the basement of a house should be as tight as a bottle. In old pipes, which cannot be subjected to so stringent a test, the quantity of water poured in at one end may be compared with that coming out at the other. It will, in one of these two ways, be quite easy to test the soundness of a drain, without uncovering it, and to repeat this experiment as often

as may be desired. This experiment will also make sure that no old open ends are left connected with the main drain, as not unfrequently happens, with the result of allowing a part of the sewage to run out into the basement. 3. Are the pipes of a house air-tight and are all the openings trapped? This will be ascertained by (the oil of peppermint test, or by) making fumes of paraffine (kerosene) inside a closed vessel over the open grid at the trap, and driving the fumes into the house system by a fan, but not so as to cause any internal pressure. When it has been ascertained that these fumes have reached the highest point in the pipes, each room in the house will be inspected, and any escape of paraffine into any room will certainly be smelt, the place of the escape will also be easily detected. 4. Are the traps and pipes of a house properly ventilated? This will be ascertained by endeavoring to put the pipes under a slight pressure by pumping air into the pipes at the bottom. If no paraffine fumes are then forced into the house, it is clear that at least one part of the ventilating system is in order. In addition to this experiment the test of passing smoke through ventilating openings will be made whenever this may seem desirable. 5. Is the drinking water unpolluted? The cisterns will be examined, the position of the overflow pipes recorded, and the action of the water-closets inspected. These experiments will, however, usually form part of the preliminary inspection. [The preceding examination will suffice where houses are supplied by an aqueduct water, whose character is accurately known. In other instances, as of wells, chemical tests, both quantitative and qualitative, are often absolutely required. This fact has been recognized by the Newport Association, one of whose regular officers is a professional analyst.—H. R. S.]

“Shortly after these experiments have been completed, the householder will receive a report stating the result; stating also whether any alteration in the house-fittings seems desirable or necessary, and approximately at what cost these alterations can be made. If they are carried out, the work done will be inspected. All reports will be made according to principles laid down by the consulting engineer, and all doubtful cases will be submitted to him. It will be the object of the engineers to meet the convenience of the members in every way. They will have no interest in advising that work should be executed, or any particular apparatus adopted. Moreover, their reports will be made subject to the check which an elected council will afford. It is expected that the result of these first complete examinations and reports will be to cause the house to be put in thoroughly good order as regards sanitary arrangements; but it may have been observed that not one of the five conditions laid down as essential can be permanently secured without systematic inspection.

It is too often supposed that all that is necessary in a house is once for all to put the drains in good order, and that for ever afterwards they may be wholly forgotten. Every medical officer of health must know how completely false the assumption is. The fact that a drain is free to-day gives no guarantee that it will not be choked up five years hence. The fact that it is water-tight to-day gives no guarantee that, whether by the perishable nature of the materials with which it is made and jointed, or by such accidental causes as unequal settlement or occasional violence, the drain may not be seriously leaky five years hence. The fact that pipes to-day are air-tight gives no guarantee that lead will not corrode or iron rust, so as to let out sewer-gases hereafter. Cisterns may be well placed and well fitted up, and yet be so neglected that they become foul; and the fittings may become so rusty and corroded as to act improperly and injuriously. Lastly, alterations may be made heedlessly or ignorantly, which may actually withdraw the protection originally afforded. In the writer's opinion, house-fittings, even when constructed according to the best possible system, should be periodically inspected, and this inspection will be given yearly by the Association, under the superintendence of highly skilled men.

“It should be observed that the Association aims at giving a new thing, or rather a thing which, though not absolutely new, is yet quite new to the ordinary householder. The Association does not aim at doing better something which the architect or the plumber has hitherto done, but at doing something which neither architect nor plumber ever do. Neither does it relieve the municipality from any part of its responsibility. The municipality may intervene inside a house where some evil has already occurred, or where neighbors are injured, but it can never undertake the private duty of keeping the internal fittings in good order by periodical inspection. It might as well inspect the beds and bedding of the inhabitants to see whether these are sufficient. Each householder must manage his own house-fittings in his own way, but he may make sure of obtaining sound advice and careful experiment by the payment of a guinea to the Association. It will be seen that the joint inspection will be neither costly nor inconvenient; that the object of the Association will be rather to insure that existing fittings are in sound working order than to suggest the adoption of novel appliances; that there is no pretence or wish to take the work of architects or of plumbers out of their hands. When alterations on a large scale are necessary, the designs for these clearly cannot be made for a guinea. The householder will in these cases be advised to consult an architect. Privacy will be secured, for no reports will be made public beyond such general statistics as have a general interest. In fine, the Association will meddle with no existing interest.

It will educate the community in sanitary matters, strengthen the hands of the public authorities, and indirectly exercise a most beneficial influence over the work executed on all new buildings. It will foster the introduction of many new minor contrivances, such as ventilators, stoves, and so forth, which often remain unknown to the general public for years after their invention, and at the same time it will offer some check to unscrupulous advertisers.

“The Association will, it is hoped, be of great use to the poor, who cannot afford themselves to pay the subscription. It is intended that members should have the privilege of obtaining reports on poor houses at small rates. In this way those who visit the poor may learn definitely what is the matter, when they have reason, from the presence of foul smells or otherwise, to suppose that defects exist. The Association will have no power to compel any one to remedy those defects, but may, when the Council think that the law is being broken, bring the case to the notice of the proper authorities. In other cases the defect may be remediable at so small a cost that either the landlord may be induced to make the change, or charity itself may provide what is required. In any case, to know definitely what is wrong is to advance a long way in the direction of providing a remedy. Systematic investigations of this kind, moreover, will provide a large body of valuable statistics, which may serve to show in what direction existing laws require modification. It must be borne in mind that the Association will only step in where invited, and where it is welcome. Schools, public and private, hospitals, almshouses, churches, hotels, lodging-houses, should all be inspected; and it may be well to mention that the occupier of a single flat is not excluded from the benefits of the inspection, even though his neighbors may refuse to concur in any joint action. It will be the aim of the engineers to make each occupier independent, as far as may be, of his neighbors.

“Two strange fallacies deserve notice. One is, that it is of no use to put private sewers in good order so long as public sewers are in bad condition. This is eminently untrue; for, the worse the condition of the public sewer, the more necessary is it that each house should be cut off and protected by the perfection of its internal arrangements. The other fallacy is, that if town sewers were good, there would be no need for good internal fittings. This is certainly absurd; for, independently of the dangers which arise within the house itself, and which may be sufficiently serious, it may be said confidently that the best managed public sewer, receiving, as it does, the taints of numerous diseases, must always be a source of some danger to all houses into which common-sewer gas is admitted.

“It is hoped that Associations may be formed elsewhere, and that the public may be found ready to act on skilled advice when given by

engineers holding the same position towards their clients as the engineers of companies hold relatively to their shareholders. The council of an Association, elected by the members, can have no object but that of engaging the best engineers they can find; and being themselves householders, and well acquainted with the town where the Association is formed, they will be certain to prevent any fanatic from suggesting extreme measures. Plumbers, builders, and other sanitary manufacturers, will find the establishment of these Associations to their interest, for they will have to carry out all alterations and improvements recommended. At the same time, the householder will have the satisfaction of knowing that the tradesman is working under skilled inspection. The father of a family, when he has carried out the recommendations of the Association, will be able to sleep in comfort, with the knowledge that he has done his best to procure and act on competent sanitary advice. He will know that the responsibility of seeing that cisterns are clean and drains in working order no longer rests on him. The inspector has been round, and reports that every reasonable precaution which common sense and technical knowledge can suggest has been taken.

"It is hoped that the medical profession may give their hearty support to the new movement; that they will do so may be augured from the ready adherence which the Presidents of the College of Physicians and the College of Surgeons gave to the scheme. The responsibility of a medical attendant is heavy enough to make him welcome any proper means by which he may be relieved from the responsibility of giving advice concerning drains and other engineering matters—advice which has certainly, in thousands of cases, been beneficial, but which can neither be given with the fully trained knowledge of the engineer, nor be received as coming with such a clear authority. Moreover, in recommending the Association, the medical man will not exercise any invidious patronage; he will merely tell his patients that a council of men, well known to them, have selected professional advisers who are likely to be thoroughly competent, as having been carefully selected by such men, and who are certain to gain immense experience in the course of their annual inspections."

"And here a word may be useful"—I am now quoting from my own previous paper—"as to how best to convince persons that in their own localities there is any need of sanitary protection. That every life prematurely or unnecessarily lost through filth poison, every health permanently or even but temporarily destroyed, means just so much money lost to the community as was represented by that person's productive power, is beginning to be understood. But far beyond and more forcible than this

reasoning is the undeniable fact that every single death over and above the necessary percentage of mortality caused by accident, non-preventable disease, and old age, means one less chance for the longer survival of each and every individual. Such argument as this strikes home. The general necessity of sanitary protection may, however, be granted, and yet doubt remain as to its local, immediate need. To prove this, there is perhaps no more convincing, just or reliable method than by comparison, especially if with some well-known point that is very near at hand. An illustration of such reasoning may be interesting, and I therefore will quote the results of my own investigations in the case of Newport. It had naturally and very properly been asked by those opposed to any change, for the 'facts and figures' tending to show that there was any room for sanitary improvement at Newport. To this I replied as follows:—

“‘It is granted, by those of us who desire improvement in these matters, that Newport is in certain respects a comparatively healthy city. We may go farther than this, however, and ourselves furnish distinct proof that this is the case, from the long series of State registration reports of Rhode Island. Providence (the other chief city of the State) may, perhaps, be taken as the basis of comparison, as this will bring the facts more clearly home to every Newporter. The earlier State reports gave more exact statements regarding Providence than of our own city. For convenience sake, therefore, we shall cite the latest published reports, those for 1876 and 1877, the latter of which bears date, Jan. 1879. The reports show clearly:—

“‘1. That old age is attained in Newport to a remarkable degree. In 1876 but 3.83 of the total deaths in Providence were from old age; in Newport there were 9.22, or nearly three times as many. In 1877 there were 3.26 in Providence, and 11.90 in Newport, a still greater proportion.

“‘2. That a smaller proportionate number of children under ten years of age die at Newport than at Providence. In Newport, in 1876, this mortality was .25 of the whole, and .34 in Providence; in 1877, .22 in Newport, and .30 in Providence.

“‘3. That the general death-rate of Newport is smaller than that of the city of Providence, and the whole State by itself, and is as small as that of the rest of the State besides Providence. In 1876 the general death-rate of Providence was 18.50 per thousand, that of the whole State 15.9, that of the rest of the State be-

sides Providence, 14.28, and that of Newport 14.50. In 1877, the general death-rate of Providence was 19.25, that of the whole State 17.2, that of the rest of the State besides Providence 15.94, and that of Newport 13.50.

“4. This comparison with Providence may be shown in another way. In 1876 there was 1 death to every 54 persons in Providence, and 1 to every 69.1 in Newport. In 1877, 1 to every 51.94 in Providence, and 1 to every 74.32 in Newport.

“5. It is proved by the State reports for many years back that Newport has a decidedly smaller mortality from consumption and other pulmonary diseases than Massachusetts, or even the northern portions of Rhode Island.

“All this is granted most willingly. It places Newport probably in a more favorable light than even those most opposed to sanitary improvement had ventured to claim. But there is a converse to it, as follows, which should be admitted just as fairly:—

“6. Newport has nearly the same mortality as Providence from cholera infantum, a disease partly the result of improper diet, partly from exposure to solar heat, and partly due to filth surroundings. In 1876 the deaths from cholera infantum at Providence were 6.70 of the total mortality, and in Newport 11.29; much greater in Newport. In 1877 they were 4.76 in Newport, and 6.32 in Providence.

“7. Omitting at present all reference to diphtheria, the dispute as to its nomenclature tending to invalidate the returns, we find that scarlet fever, a disease originating in filth, fostered by filth, and dependent for its transmission upon disregard of sanitary laws, though not raging as an epidemic in either city during the years specified, caused a much greater mortality in Newport than in Providence. In 1876, 2.57 of the whole deaths in Newport were from scarlet fever, in Providence but 1.89. In 1877, .62 in Providence, and 1.89, or three times as many, in Newport.

“Typhoid fever, however, as purely a filth disease, and only spread through filth exposure, is directly to the point. In 1876 the proportion of deaths from typhoid in Providence to the total mortality was 1.79; in Newport 4.11, or more than double. In 1877, in Providence 2.18, and in Newport 2.38; still a greater proportion in Newport.

“To the above, it cannot be argued that in the first of these

years there were but 8 deaths from typhoid in Newport, while there were 33 in Providence, for the total number of deaths from every cause in Providence was nine times those of Newport. To make Newport therefore stand only as well as Providence, it should have had one-half less deaths from typhoid. To make Providence stand as badly as Newport, it should have had more than twice as many as it had. In 1877 there were 4 deaths from typhoid in Newport, against 42 in Providence; the proportion still remaining larger than in the latter city.

“‘However that may be, the fact remains that nearly one-thirtieth of all the deaths at Newport during the last two years, of which we have any official information, were from a disease the occurrence of but a single case of which goes far to prove grievous fault or negligence upon the part of a city government, for which its individual members should be held to be responsible.’

“The importance of the whole matter was, perhaps, particularly great at Newport; for it is a city that nature seems to have intended not merely as the great summer watering-place of our Eastern coast, but eventually its chief winter sanitarium for consumptives and other delicate invalids. Its sanitary condition, therefore, becomes an affair of direct and common solicitude to all members of the American profession. Now a watering-place, and still more a health resort or climate cure, is nothing if not clean; and cleanliness, unless it be perfect and thorough, both without doors and within, is apt to be for invalids, and of all things, itself the most unclean. That is to say, delicate persons, predisposed to injury from even trivial causes, are apt, if they are recommended to a special place as best adapted to their case or their condition, particularly if by their physician, to be off their guard, and to receive, perhaps, irremediable harm. What is true of Newport, as a common ground interesting to every physician, is equally important in the field of his own private practice at home.”

To the above, I simply add, as an appendix, a copy of the form employed by the inspecting engineer of the Newport Association, in rendering his reports to the Council. It has repeatedly been inquired for by correspondents, and will be found useful in arranging similar systems of investigation. It was prepared by the Newport inspecting engineer, Mr. Fludder, then submitted for revision to a committee of the council, con-

sisting of Dr. Rankin, late acting assistant sanitary inspector of the New York Board of Health, and myself, and subsequently, for final suggestions, to Col. Waring, the consulting engineer of the Association. Though it may at first sight seem unnecessarily minute, it contains hardly a question that can be omitted without detracting from the thoroughness of the report.

Great stress moreover is laid by the Newport Association upon careful analysis of the drinking water from private wells, a peculiarly intricate question in that locality, so great is the percentage of chlorine in the well water, from the effects of tidal percolation, and the constantly saline atmosphere.

APPENDIX.

A.

THE SANITARY PROTECTION ASSOCIATION, OF NEWPORT, R. I.

REPORT OF INSPECTING ENGINEER, No.

PREMISES, No. STREET.

OWNER,

OCCUPANTS,

DATE OF EXAMINATION,

GENERAL STATE OF HOUSE.

BED CHAMBERS.	number,	basement,	1st story,	2d story,	3d story,
	ventilated,		how,		
	lit by gas,				
	carpeted through the year,				
	green wall papers,				
	condition of ceilings, windows, and walls,				
HALL WAYS.	ventilated		through roof or otherwise,		
KITCHEN.	position,	condition,	ventilated,	how,	
	condition beneath,		signs of rats,		
CELLAR.	condition,		wet,	damp,	dry,
	ventilated,	where to,	how,		sunlight,
	flooring,	material,		condition,	
	ceiling,				
	siding,				
	partitions,				
	foundation walls,				
	any improper contents,				

signs of rats, furnace, cast or wrought iron, air supply, where from,
 water supply, condition,
 Direct communication between cellar and bed chambers, by side of
 pipes, or chimneys,
 REMARKS.

WATER SUPPLY.

WELL. depth, distance of water from surface of ground,
 condition, surroundings, distance from nearest cesspool,
 privy, drain or surface wash, distance from nearest stable, hog
 pen or hen house, material of walls, curb material,
 condition, covered, how, how water
 drawn, if by pipe, material, used by others than
 family, when last emptied and cleaned,
 If more than one well, is second used in any way for household,
 describe it, as above,

CITY MAIN.

CISTERNS. number, position, material,
 condition, covered,
 surroundings, exposed to surface drainage,
 used by others than family, sources of supply, main roof, piazza roof,
 shed roof, stable roof, from well, or other cisterns, or city main,
 material of water shed, condition of water shed,
 recently painted, condition of
 conductors, how water drawn, used for drinking
 or cooking, any apparent overflow, to where,
 if within house, describe particularly,
 deposit in cistern,

REMARKS.

DRAINAGE.

WATER CLOSETS. number, position, basement, 1st floor,
 2d floor, near side of house, near centre of house,
 are all trapped, how, are all
 ventilated, how, are all supplied
 with water, from city main, how many, which ones,
 valve or wire, from main tank or cistern
 of house, how many, which ones,
 valve or wire, from separate cistern or tank, how many,
 which ones, valve or wire, do any
 connect with bed chambers, which ones,
 condition,

SET BATH TUBS. number, position, basement, 1st floor,
 2d floor, does room connect with bed chamber,
 separate traps, kind, where discharge,
 condition,

SET WASH BOWLS. number, position, basement, 1st floor,
 2d floor, in bed chambers, or rooms connecting,
 separate traps, kind, where discharge,
 condition,

SLOP HOPPERS.	number,	material,	position,
	in bed chamber, or room connecting, or hall,		separate traps,
	kind,	where discharge,	
	condition,		
KITCHEN SINK.	material,	separate trap,	kind,
	where discharge,	condition,	
SET WASH TUBS.	number,	material,	position,
	separate trap,	kind,	where discharge,
	condition,		
SOIL PIPES within building.	number,	material,	position,
	ventilated, how,	if artificial draught, how,	
	condition,	signs of leakage,	
WASTE PIPES leaving building,	number,	material,	position,
	ventilated, how,	where,	
	condition,	signs of leakage,	
DRAIN FROM HOUSE.	material,	trapped,	how,
	where discharge,	ventilated,	how,
	where,		
	condition,	signs of leakage,	
DRAIN FROM CELLAR.	material,	position,	trapped,
	how,	where discharge,	
	condition,		
CESSPOOL.	number,	material,	position,
	size,	distance from well,	cistern,
	or wall of building,	overflow,	to where,
	accessible to surface water,	ventilated,	how,
	to where,	how often emptied,	condition,
		amount of contents,	
PRIVY.	number,	position,	direct connection with house,
	how,	size of vault,	material of walls,
	bottom,	water-tight,	distance from well,
	cistern,	wall of building,	overflow,
	to where,		accessible to surface water,
	ventilated,	how,	to where,
	used by others than family,		condition,
		how often emptied,	
HOUSE OFFAL.	where kept,	how often removed,	
	by whom,		
ASHES, etc.	where kept,	how often removed,	
REMARKS.			

OUT BUILDINGS.

STABLE.	condition,	distance
	from house, well and cistern,	how drained,
	how manure disposed of,	
HOG PEN.	condition,	distance from
	house, well and cistern,	how often cleaned,
HEN HOUSE.	condition,	distance from
	house, well and cistern,	how often cleaned,

PIGEONS KEPT. where,
 MUCK HEAP on premises, or any other possible source of danger,
 Any nuisance in neighborhood,
 House ordinarily dry or damp, sweet or musty, in winter cold or comfortable,
 Average health of inmates,
 REMARKS.

Repairs or alterations recommended to the council,

Signed,

INSPECTING ENGINEER.

B.

OFFICERS OF THE SANITARY PROTECTION ASSOCIATION OF NEWPORT, R. I.
 (Established November 11th, 1878.)

Council.

HON. SAMUEL POWEL, President.

HON. FRANCIS BRINLEY, Vice-President.

HON. THOMAS COGGESHALL, President of Aquidneck National Bank, and Post-master of Newport, Treasurer.

The Rev. W. S. CHILD, S.T.D., Head Master of St. John's House.

GEORGE BOWEN, ESQ., President of New England Commercial Bank.

The Rev. PHILIP GRACE, D.D., Rector of the Church of the Holy Name of Mary, Our Lady of the Isle.

LUCIUS D. DAVIS, Editor of the Daily News.

FRANCIS H. RANKIN, M.D., Late Acting Assistant Sanitary Inspector New York Board of Health.

E. M. STEDMAN, Lieut. Commander, U. S. Navy, Recording Secretary.

CHARLES A. BRACKETT, D.M.D., Instructor in Dental Therapeutics, Harvard University.

HORATIO R. STORER, M.D., Corresponding Secretary.

Consulting Engineer.

Col. GEORGE E. WARING, JR., Hon. Member Royal Institution of Engineers, Netherlands: Cor. Member of the Council of the Sanitary Institute of Great Britain.

Inspecting Engineer.

Mr. W. H. FLUDDER.

Analyst.

WM. B. HILLS, M.D., Boston, Instructor in Chemistry, Harvard University.

THE RELATIONS OF THE CODE OF ETHICS TO STATE AND MUNICIPAL SANITARY ORGANIZATIONS.

By JAMES F. HIBBERD, M.D.,
RICHMOND, IND.

ETHICS is defined to be "the science of human duty," and "the body of rules for duty drawn from this science."

A code of medical ethics is a body of rules for the conduct of physicians, and such a code was promulgated for the guidance of American physicians in 1847 by the American Medical Association, and has remained intact since. The sufficiency of this code is not here in question, but, in passing, it may be said that the adaptation of these rules to the end aimed at must have been excellent or they would have undergone alteration in the thirty-two years of their existence. It is not supposed that they will meet all cases for all time—indeed long and loud complaints have already, and frequently, been made that they are sometimes inadequate and often unjust; but on investigation such cases have usually, perhaps always, been found to be either a bias on the part of the complainant, a misapprehension of the facts, or of that exceptional character that a general code, however complete, could not cover in detail.

It is this code that we are to consider in its relations to State and municipal sanitary organizations. The code has three grand divisions, treating, first, "Of the duties of physicians to their patients, and of the obligations of patients to their physicians;" second, "Of the duties of physicians to each other and to the profession at large;" and third, "Of the duties of the profession to the public, and of the obligations of the public to the profession." It is the third division that more directly covers the relation of physicians to sanitary organizations, and the first section of the first article of this division contains this declaration: "As good citizens, it is the duty of physicians to be ever vigilant for the welfare of the community, and to bear their part in sustaining its institutions and burdens; they should also

be ever ready to give counsel to the public in relation to matters especially appertaining to their profession, as on subjects of medical police, public hygiene, and legal medicine. It is their province to enlighten the public in regard to quarantine regulations; the location, arrangement, and dietaries of hospitals, asylums, schools, prisons, and similar institutions; and in regard to measures for the prevention of epidemic and contagious diseases."

This is pointed and direct, and so completely presents the duty of the physician in behalf of sanitary affairs that it leaves no room for cavil, nor misunderstanding in regard to the general abstract proposition; and probably no difficulty has arisen or is likely to arise where all the medical men associated in the service of sanitary organizations are scientific physicians, and the laymen so associated are of the same faith as the physicians in medical theories. But this is not always the case. Sanitary commissions are created by State and municipal authorities, and these sometimes thoughtlessly, more generally with intent, appoint disciples of dogmatic medicine on these boards with true physicians, and this promptly raises the question whether physicians can consistently with their code of ethics serve in such association.

Section 1 of Article I. of the second division of the code declares that "every individual on entering the profession, as he becomes thereby entitled to all its privileges and immunities, incurs an obligation to exert his best abilities to maintain its dignity and honor."

Article IV. of second division of the code treats "of the duties of physicians in regard to consultations," and the first section, after setting forth that physicians may consult with all regular practitioners, closes with this sentence: "But no one can be considered as a regular practitioner or a fit associate in consultation whose practice is based on an exclusive dogma, to the rejection of the accumulated experience of the profession, and of the aids actually furnished by anatomy, physiology, pathology, and organic chemistry." Quite clearly this quotation does not, as has been asserted, forbid all association with irregular practitioners of medicine, but simply bars all professional recognition of them in clinical consultations; and there is abundant reason why such a bar should be raised and enforced. Certainly no physician could give or receive assistance in consultation with a

professed doctor who maintains that the centillionth of a grain of mercury will produce a medicinal effect, or with one who asserts that opium and all of its alkaloids are poisons that should never be used as medicaments. A physician who would thus consult would not be maintaining the "dignity and honor" of the profession, nor could he have the welfare of the patient at heart; the logical inference would be that such an act would be performed through mercenary influence. But there is nothing in the quotation that can be construed into a prohibition of service with an irregular practitioner on a board of health or other sanitary organization, whether of the nation, State, or city.

Accordingly, we find that the Code of Ethics does not in terms, nor by inference, forbid physicians associating with irregulars in sanitary organizations; while, on the other hand, the first section of the first article of the third division of the code, already quoted, is not only permissive, but fairly mandatory that service be taken in these organizations for the public good, without reference to who shall constitute the other members.

Silence on this point by the code relegates the question for adjudication to the tribunal of social science and common sense. Physicians may not meet irregulars at the bedside in the practice of medicine, but sanitary organizations do not practise medicine, and many of them are never required to even make provision for the victims of disease; their duties relate chiefly to the prevention of disease through the application of science, and this a man may fully understand and yet be a typical loon on the practice of medicine.

No question is made but that it would be better as an abstract proposition to have all the members of such organizations thorough and perfect in every department of the science of health, but in the very nature of things this cannot be the rule. Appointments to these situations are made by legislative or other representative bodies of the people, and, while a considerable proportion of the people employ and have faith in irregular practitioners of medicine, their representatives will insist on placing some of these irregulars in important and conspicuous positions where such knowledge as they lay claim to is demanded. While with the populace all doctors are presumed to be learned in sanitary science, and while men eminent in statecraft, in law, in theology, in literature, and in business, and wealthy and influential men, and gentlemen of elegant leisure in all parts of

the Union cannot or will not distinguish between real knowledge and assumed knowledge in medical men, we must expect them sometimes to exercise their preference for irregular practitioners in responsible public positions as they exercise it in committing their own lives, and the lives of their families when ill, to the professional care of these irregular practitioners. Nor can physicians rightfully claim to dictate an abandonment of this course until they can so make their superiority shine that all intelligent people can recognize the position they occupy as the true and the honest, and the position of the irregulars as the false and dishonest or ignorant. Physicians must not assume that intelligent people know that they are right and the irregulars wrong, and that they favor the latter, where favor is manifested, through a certain perverseness of human nature; possibly there may be exceptional cases of this kind, but the rule is broad and patent that intelligent people will cling to, support, and defend that which is best for individual and general welfare, whenever and wherever they recognize it; and, if such people receive irregular rather than regular practitioners of medicine into their private favor and push them into public offices, we may feel assured that they are acting according to the light they have, and physicians must be content to accept the situation until by intrinsic merit and good works they can compel them to discriminate, unhesitatingly, between the real and the presumptuous. And until this is done, and as a possible aid in accomplishing it, it will be not only the privilege but the duty of physicians to accept service in sanitary organizations composed in part, if unavoidable, of irregular practitioners of medicine, if such physicians would accept such service if the whole commission were composed of physicians or other scientists.

While a laudable self-respect and a proper professional *esprit* should deter a physician from entering a sanitary organization composed of boors, ignoramuses, or knaves, whether professionals of any class or laymen, the fact that a member of it practises dogmatic medicine as an industry should not be held to be conclusive that he is a boor, an ignoramus, or a knave, but his quality in this particular should be determined by the same rules that would be invoked to settle the same points in regard to any other member with whom there was a radical difference in science, religion, or politics.

If physicians may, without prejudice or losing caste, be asso-

ciated with irregulars in church councils, boards of education, scientific associations, mutual benefit corporations, social societies, and in national, state, and municipal legislatures—and this is done over the whole country, and continually,—why should sanitary organizations be the only bodies into which a physician may not enter with an irregular without exciting fastidious notions of the impropriety of the act? So long as medicine is not an exact science and its disciples are not all perfect, physicians should not proclaim war upon the world because the world will not accord them the merit they are entitled to, or will credit irregulars with merit they do not possess. We should all take the world as it is and make the best of it, and it would be of the nature of puerility, or stolidity, or imbecility to refuse to make use of talents we have because others are credited with talents they have not.

In some States and cities the situation is this: physicians must sometimes serve in sanitary organizations with irregular practitioners of medicine, or they must refuse to give the public the benefit of their knowledge of, and skill in, sanitary science through State and municipal commissions, a refusal that patriotism and professional responsibility alike deny them the right to make except for adequate cause.

REGISTRATION OF DISEASES.

By G. B. BALCH, M.D.,

NEW YORK.

I AM aware that in advocating the registration of diseases I am treading upon disputable ground. Is it not, however, our duty as physicians to open every avenue of knowledge, and improve every advantage that will work the most good to the greatest number? Should we hesitate to advocate any measure that will give health and happiness, and prolong the lives of our fellow mortals? We shall be met by the statement that many necessary vocations *are* attended with great danger to life and health, and that registration would have a tendency to drive away labor from those vocations to those more healthy and thereby increase the wages paid for such labor. My reply would be: inventive genius will devise machinery to do the work, or sanitary measures to reduce the danger to the minimum or entirely. The object is, not to interfere with the industries of the land, but to aid; and aid most substantial will be given if the health of the laborer is kept good. Much theory has been adopted as fact without proof of experience and statistics; what we want is absolute knowledge. The old saying that "those whom the gods love die early" (meaning the good and brilliant) is accepted by most as a fact: yet there is no proof. It has also been asserted that brain-workers are short-lived. There is evidence to prove the contrary, and that they are really longer-lived than the average. All registration of deaths and diseases thus far have been imperfect and necessarily will be so, but that it can be improved upon there is no doubt. In our cities only is there a pretence at registration of diseases, and those only of an imperfect nature: much valuable information has been gained from their records. In the country we have no accurate knowledge of the prevalence of different diseases and their local and general causes.

“The registration of all the cases of the commonly prevalent diseases of a community or locality, among such portions of the population as may be necessary, would be the most correct method of forming an estimate of the state of the public health. It is certainly practicable to register the more prevalent maladies of a community—a mining district or manufacturing establishment—likewise of a city or populous district. Such a registry of diseases would bring to light many causes of sickness hitherto unrecognized, and thus enhance the means of improving the public health. Much time is generally lost after the outbreak of a disease before the facts are made known to the sanitary authorities; hence valuable lives are sacrificed, suffering and poverty often result, and the opportunity is lost of ascertaining the source or cause of the disease, and of limiting or preventing its spread. A systematic registration of all causes of sickness, whether fatal or not, would instruct the sanitary authorities as to the state of the public health, and furnish them with the advantages afforded by the speediest information.” The above I have quoted from a paper by Dr. Wm. Clendenin in the first volume of the Public Health Report. I fully endorse the ideas therein expressed. There are diseases that are quite common, the phenomena of which we are familiar with, yet the cause and prevention of which we have hardly considered; while others that make but transient visits and are not even any more fatal in their results, receive their full share of attention from physicians and the community. What alarm is created at the report of a case of smallpox; what active measures are put forth to stop its spread! But who is alarmed at a case of typhoid fever or dysentery? yet these and other diseases can be checked and prevented by proper sanitary work. In order to find a cause we must know where the cases are and their sanitary surroundings. It belongs to us as physicians and sanitarians to work out these problems, reduce theories to facts, and prescribe the remedy. The time will come when the courts of law will hold a city or municipal government responsible for damages for not preventing the spread of infectious diseases, as much as now for an unsafe condition of the public highway.

We would hardly think that physicians would object to sanitary ordinances and laws requiring them to report infectious diseases which are liable to become epidemic, yet such is a fact.

The following petition, signed by fourteen physicians, was

sent to the common council and board of health of a certain city:—

“ We, the undersigned physicians and practitioners of medicine in the city of ———, respectfully represent that we approve all just and efficient means for protecting the public health. We also respectfully represent that we approve the spirit and intention of the ordinances entitled ‘Of the Public Health,’ being Article XXII. of the ordinances of the city of ———, and Article I. of the ordinances of the board of health of said city, the chief object of which is to prevent the origin and spread of contagious diseases. We are, however, of the opinion that *Section 13*, of Article XXII. is unnecessary for the protection of the public health—it is unjust to us by requiring us to *perform professional services* without compensation. By this section we are also enjoined and required to report, in writing, the *names* and diseases, and other *details furnished* us in *confidence* by our *patients*, for the purpose of having them placed upon a public record, thus *compelling* us to *violate* the *confidence reposed* in us by our *patients*.

“ We respectfully suggest that by repealing Section 13, of Article XXII., and enacting the following in its stead, the intention of the said article will be accomplished without necessitating the violation of our duty to our patients, or our duty to the community, viz.:—

“Section 13. Every physician residing in the city of ———, or any physician who shall at any time practise in the city of ———, while attending or treating any person sick, afflicted, or attacked by or of any of the following named diseases, viz.: cholera, yellow fever, smallpox, diphtheria, ship or typhus, typhoid, spotted, relapsing, or scarlet fever, measles, or by or of any infectious, contagious, or pestilential disease, now known as such, or of any new disease, or newly-named disease, of an infectious, contagious, or pestilential nature, is enjoined and required to direct the patient, and persons having control of the patient, to use all necessary precautions to prevent the spread of the disease, by isolating the patient, disinfecting and ventilating the premises. If the patient, or the persons having control of the patient, refuse or are unable to carry out the directions of the attending physician, it shall be the duty of the attending physician to report the case to the health officer. The health officer is hereby forbidden to enter in his official capacity the private apartment of any patient or sick person without the consent and presence of the attending physician, or the persons having control of the patient or sick person.”

The following was Section 13 of said ordinances which these fourteen physicians petitioned to have repealed:—

"Section 13. Every physician residing in the city of ———, and every physician who shall at any time practise in the city of ———, is hereby enjoined and required to report in writing to the health officer, within twelve hours after discovery by him, the name of any and every person sick, afflicted, or attacked by or of any of the following named diseases, viz. :—cholera, yellow fever, smallpox, diphtheria, ship or typhus, typhoid, spotted, relapsing, or scarlet fever, measles, or by or of any infectious, contagious, or pestilential disease now known as such, or of any new disease, or newly named disease of an infectious, contagious, or pestilential nature. Such report shall specify the name of the person sick, the residence of such person, the name of the disease, the time of the first attendance of the physician, the duration of such sickness before the first attendance of the physician as near as can be ascertained, and the source of contagion or cause of sickness if known. Such report shall be delivered within said twelve hours to the health officer in person, or at his office. The health officer shall record and register in a book suitable for the purpose all the facts and information stated in such report respectively."

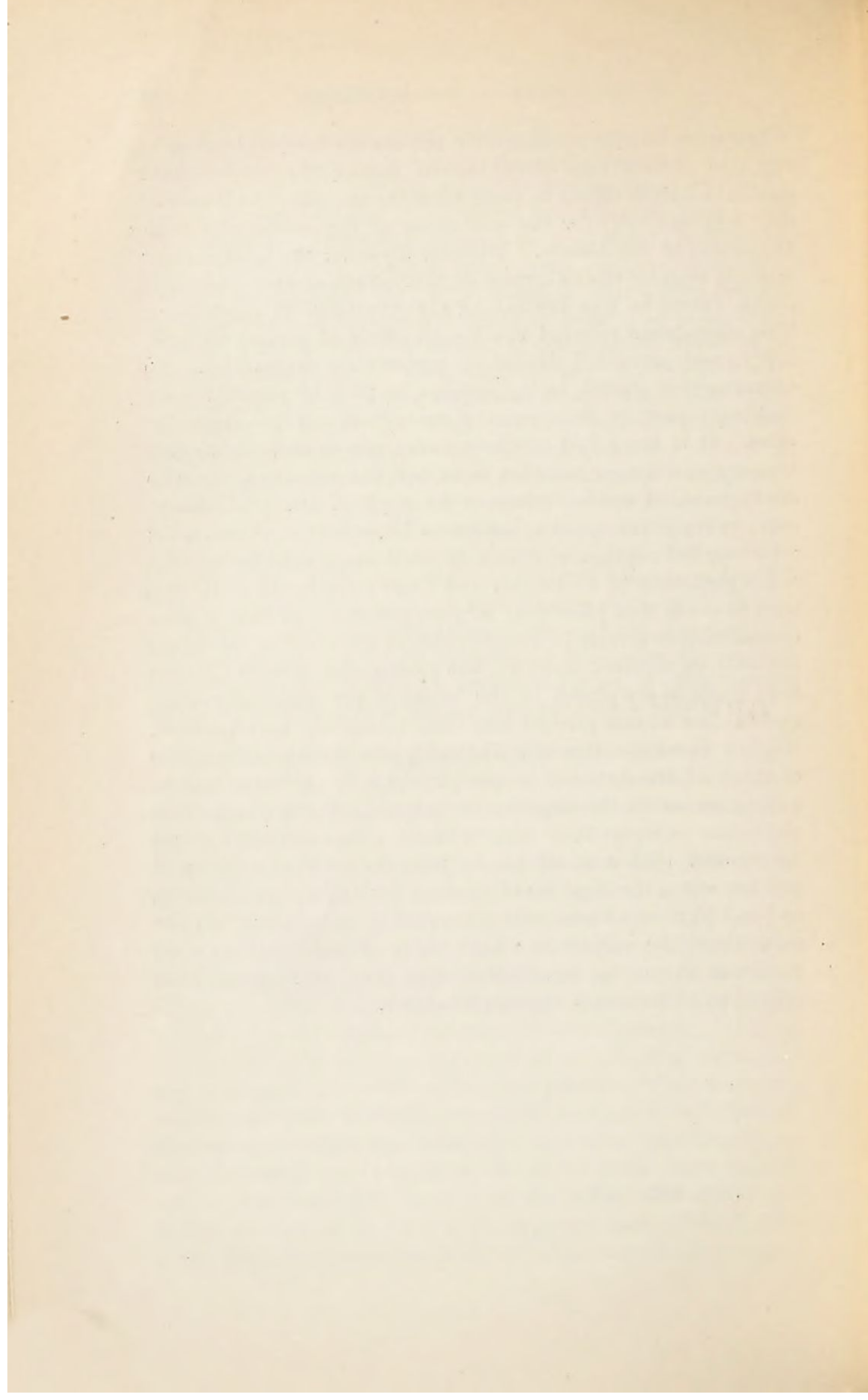
This ordinance was founded on the following clause in the charter of said city: "Every practising physician in said city, who shall have a patient laboring under any infectious or pestilential disease, shall forthwith make report thereof in writing to the health officer, and for neglecting to do so shall be deemed guilty of a misdemeanor."

When we come to analyze the petition of these physicians we find that their protest is wholly against reporting infectious or contagious diseases, and any supervision over the same by the health officer.

We find that they complain against rendering professional services without compensation, and in the next breath asking to have an ordinance passed "enjoining and requiring" them to perform services purely professional. On looking at the matter closely, one cannot fail to see professional jealousy, a fear that the health officer would take advantage of his official position to tread upon the professional corns of his neighbors.

The ordinance was amended, but in no essential particular was it changed to conform with their petition. They were still required to report to the health officer diseases of an infectious or pestilential nature that were liable to become epidemic. They were furnished with blanks on which to make their reports, and stamped envelopes directed to the health officer, and permitted to send their reports through the mail. Twenty-four hours were given instead of twelve in which to make their report.

In case it became necessary for the authorities to interfere in any case of infectious or contagious disease, the mayor could order the health officer to enter upon the premises and do whatever was necessary for the protection of the community from the spread of the disease. Without his order the health officer was not to enter the sick-room of the patient of any other physician, except he was invited by the physician in attendance. This amendment relieved the health officer of a great responsibility, and prevented danger of professional discourtesy. No compensation should, in my opinion, be paid to physicians for making reports of their cases of contagious and infectious diseases. It is but a just service we owe the community to give warning of a danger manifest to us, but unknown to many who are exposed. I can but reiterate the words of Dr. H. B. Baker, who, in reply to a communication to him on the subject, said: "Do you tell me that a doctor of medicine, a member of that noble profession to which you and I have the honor to belong, tries to evade that plain duty of giving warning of danger from communicable disease? I reply that, in my opinion, he should not only be required to do so, but such a man is unfit for such high trusts as are placed in the hands of the family physician, and the law should prevent him from occupying that position. His low moral standing will disqualify him for the performance of many of the duties of a true physician." As there may be a question as to the legality of enforcing the law requiring physicians to report their cases without compensation, I would recommend that a small fee be paid for each case reported (say ten cents, the legal fee of a notary for taking an affidavit), and any physician found wilfully reporting cases which do not exist should be subject to a heavy fine. Blanks and stamped envelopes should be furnished, so that the physician shall be subject to no monetary expense whatever.



MINUTES OF THE SECTION

ON

OPHTHALMOLOGY, OTOTOLOGY, AND
LARYNGOLOGY.

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OPHTHALMOLOGY, OTOTOLOGY, AND LARYNGOLOGY.

TUESDAY, May 6, 1879.

THE Section convened at 3 o'clock P. M., with Dr. H. KNAPP, of New York, in the chair. In the absence of the regular Secretary, Dr. SCOTT, Dr. A. W. CALHOUN, of Georgia, was elected temporary Secretary; Dr. POPE, of Louisiana, was elected Vice-President, and Dr. E. WILLIAMS, of Ohio, was elected honorary President.

The first business in order was the reading of a paper by Dr. E. WILLIAMS, of Ohio, on *Ivory Exostosis of the Orbit*, giving also the literature of the subject.

Dr. KNAPP gave his experience with such cases, and mentioned where a report of others could be found.

Dr. KNAPP, of New York, exhibited a specimen of a large tumor growing from the acoustic nerve. The specimen was given by Dr. STEVENS, of New York, who will report the case in full in *The Archives of Otology*. The microscope shows the nature of the tumor to be sarcoma, with spindle-shaped cells.

Dr. E. SMITH moved a vote of thanks to Dr. KNAPP and Dr. STEVENS for the presentation of the tumor.

Dr. KNAPP moved a vote of thanks to Dr. WILLIAMS for his interesting paper.

Dr. A. V. VOORHEES, of Tennessee, gave an oral report of a case of *Temporary Blindness from large doses of quinine*. The report provoked a good deal of discussion, and Dr. VOORHEES was requested to watch the case and report its progress at a future meeting.

Dr. KNAPP presented an enucleated eye of a child, the microscopic examination of which leads him to call the disease "tuberculosis of the eye." Microscopic slides were shown and elicited great interest.

The Section adjourned to meet at 9 A. M. Wednesday.

WEDNESDAY, May 7.

The Section met at 9 o'clock A. M., Dr. KNAPP in the chair, Dr. CALHOUN Secretary *pro tem*.

Dr. B. A. POPE, of Louisiana, made some interesting remarks upon enucleation of the eyeball. He contended that it was better to remove only the anterior portion of the ball, where at all practicable, so as to allow of the better wearing of artificial eyes. In sympathetic cases, he has divided the ciliary and optic nerves in addition to making the above operation.

Dr. KNAPP objected to this mode of procedure, for fear of the insufficient effects of the operation.

Dr. WILLIAMS agreed with Dr. POPE in his remarks.

Dr. POPE then read his paper criticizing the various steps in the different operations for cataract. It was a very instructive paper.

Dr. A. W. CALHOUN, of Georgia, read his paper entitled *A Report of one hundred and eighty-five Cataract Operations, with some suggestions as to after-treatment, etc.*

After some discussion, the Section adjourned till 3 o'clock P. M.

AFTERNOON SESSION.

Dr. KNAPP read his paper on *Cataract Operations*, after which a general discussion ensued upon the papers of Dr. POPE, Dr. CALHOUN, and Dr. KNAPP.

Dr. D. S. REYNOLDS, of Kentucky, read a paper on *An Operation for the Radical Cure of Cystoid Cicatrix*, the result of glaucoma and other operations or injuries.

Dr. E. SMITH, of Michigan, read a paper on *Xerophthalmia and its Cure by Operation*. This excited a good deal of comment.

Dr. KNAPP presented beautiful specimens of plastic iritis, and a foreign body in the eyeball, resting upon the ciliary processes.

Adjourned till 9 A. M. Thursday.

THURSDAY, May 8.

The Section met at 9 o'clock A. M., Dr. KNAPP in the chair, Dr. CALHOUN Secretary *pro tem*.

Dr. KNAPP presented several exceedingly interesting microscopic specimens, amongst which were sarcoma of the iris, the region of Fontana's spaces in normal and glaucomatous eyes, iris in wound after cataract operations, and others.

Dr. KNAPP made also some very extended and interesting remarks upon *Acute and Chronic Mastoid Disease*, in the discussion of which the members took part, giving their experience, etc.

Dr. J. A. WHITE, of Maryland, did not read his paper on *Color Blindness* because of sickness.

The Section, having finished all its business, adjourned to meet in New York in 1880.

A. W. CALHOUN, M.D., *Secretary pro tem.*

IVORY EXOSTOSIS OF THE ORBIT.

By E. WILLIAMS, M.D.,

CINCINNATI, OHIO.

THE statement of some authors, that this is the most frequent of the bony growths in the orbit, is not borne out by reports of many well-authenticated cases. The rarity of its occurrence will be my reason for giving a detailed description of the following case:—

Mary E. T., 23 years old, of rugged constitution and in good health, consulted me March 13, 1878. It was difficult to procure a clear history of the disease on account of the patient's stupidity. For three years the family noticed a divergence of the left eye when she fixed objects closely, or was embarrassed. About one year before, an unnatural prominence of the eye was observed. Since that time exophthalmos and divergence had slowly increased, and the sight disappeared. No traumatic or constitutional origin of the affection could be traced or even supposed. Her health had been uniformly good. The patient has a broad face, flat nose, and stolid expression. Her condition, when examined, I shall try to describe. The left eye was pressed upward and outward, and protruded to such a degree that the centre of the cornea was half an inch in advance of the other. The movements were limited downward and inward, but free in other directions. With that eye she only had vague perception of light, the sight of the other being perfect. The prominence was so excessive that slight pressure on the upper lid caused it to close in behind the ball. At the lower and inner part of the orbit a tumor is seen projecting and dislodging the eye—bony hard to the touch, somewhat nodulated, but round, and extending deeply into the socket. The pupil did not respond to light, when the other eye was excluded, but remained large and fixed. With the ophthalmoscope we discovered marked neuro-retinitis from stasis. The entire retina

was hazy, the vessels tortuous, and obscured at many points with exudations. The disk was much engorged, and its margins difficult to identify. It was evident that the eye was visually useless, and, the tumor being large, deep seated, and firmly attached to the os planum of the ethmoid, I thought it safest and best to enucleate the eye and then remove the growth.

This was done under ether. After enucleation, I found by the finger that the tumor was firmly united to the inner wall of the orbit, and extended nearly to the apex. Cutting through the capsule of Tenon and the periosteum, I denuded the mass as extensively as possible. Then with the bone nippers an effort was made to cut off a portion of it, but it was so hard that with my utmost strength I could only bring away very little. I then opened a strong pair of bone forceps very widely, forced them over it so as to secure a firm hold, and by a few wriggling movements, detached it *en masse* from its connections and drew it out, thus completing the operation in a few minutes and without any shock from chiselling or slipping of the forceps. But little bleeding occurred, and the patient soon rallied from the ether. Two days afterward she returned to her home in the country. The following night, however, my assistant was called to her to arrest a severe hemorrhage from the nose, of that side.

A section of the tumor, which I here present, measures 16 mm. (a trifle over an inch) in its longest diameter. In the transverse, it measures about 10 mm. The rough bony pedicle which you see measures 8 mm. in one direction, and 5 mm. in the other, showing that it continued with the os planum by a constricted neck. As you see, the entire growth came away clean, bringing no true bone with it. It is hard as ivory throughout, admits of a nice polish, and when being sawed, emitted the peculiar smell of ivory. Its general form (supplying the portion that was chipped off by the nippers) is round, similar to a walnut, but nodulated and traversed by a deep fissure which passes round it, between the pedicle and the convex portion that pressed against the eye. Its weight is three drachms (12 grams), and with the portion that was chipped away, would have been, perhaps, a half drachm (1.8 grams) more. No vessels were to be seen on its surface or in its structure.

I will simply state in conclusion, that the patient returned about a year after the operation to procure an artificial eye, and there was no trace whatever of a reproduction.

There are, perhaps, others on record, but I have been able to find only four that are unmistakably cases of ivory exostosis of the orbit. The first one was in the service of M. Maisonneuve, of Paris, and is published in the *Annales d'Oculistique*, vol. xxxiv., 1853. I examined this case and witnessed the operation. L. Jeffrin, 22 years of age, began to feel a weight and heavy pain in the region of the right orbit in March, 1853, and soon discovered that the eye was larger than the other. On July 5, his condition was as follows: Right eye out of the socket and pushed toward the temple, the lids covering it very imperfectly. The conjunctiva was inflamed, but the tears followed their natural course, and vision was not entirely abolished. At the inner angle the round point of a tumor was felt, deep seated and hard as bone. It was not very tender to the touch, but the seat of heavy and continued pain, which kept the patient from sleep. The nostril was free. On July 14, Maisonneuve operated in the following way: A semicircular incision was made, surrounding the inner half of the orbit, commencing above the brow. The flap, including the periosteum, was separated and turned back. A few small arteries were tied. The tumor was thus exposed in its anterior and part of its internal face. It was incrustated in the inner orbital wall, and filled more than two-thirds of the orbit. Its base showed no constriction, and seemed continuous with both the inner and upper wall. Its posterior portion was too deep to be reached by the point of the finger. The anterior alone offered a rounded elevation which could be seized. He first tried to use saws of different shapes, but the space was too narrow. Liston's forceps were then applied, but the tumor was so hard they made no impression. More than half an hour passed in these efforts, and he broke two pairs of these forceps with his own hands, aided by two assistants. A Charrière forceps met with the same fate. He then tried the chisel and mallet, and succeeded, after a long time and a great deal of hammering, in chipping off a small nodule which flew across the room. Back of this was a slight constriction in which it seemed less hard. Into this fissure the chisel was firmly driven, and at last the tumor was found to be slightly movable. But it had sent a process into the nasal fossa similar to the one in the orbit, and the two parts were as if strangulated by a bony ring. After a long series of efforts with elevators, gouges, etc., the tumor was at last removed in one mass. The pit left did

not seem to connect with the antrum or nasal fossa. In all this tedious operation the eye and appendages were not bruised or damaged. The eye was replaced in the socket, and the long wound closed by sutures except at one point below. The operation lasted an hour and a half. The wound healed by first intention, and the eye soon resumed its movements and functions. The tumor was hard like ivory, and its general form like that of the ethmoid. It measured in antero-posterior diameter 50 mm., in the transverse 40 mm., and the vertical 40 mm. Its internal face was smooth and regular—its external convex and nodulated. The upper face presented a deep excavation in front, where it had been adherent to the frontal bone to an extent of two centimetres. The lower face was divided by a fissure running vertically, of which the irregular border embraced the ascending process of the superior maxillary bone. Behind, it was rounded, with a projection toward the optic nerve. It weighed 28 grammes.

A second case, by the same surgeon, is found in the same journal, vol. xli., 1863. A young man, aged 17, came to Hôtel Dieu July 9, 1863, to be treated for an exophthalmos of the right eye, which was first noticed about a year before. A few weeks later, he discovered a small, very hard prominence, at the upper and inner part of the eye. He continued his work without pain or anxiety till May, when it began to be painful; and, noticing that the disease constantly progressed, he consulted a physician. Iodide of potassium was given for six weeks, but without any effect. When he entered the hospital, the eye was completely out of the socket, and pushed downward and outward. The upper lid, greatly on the stretch, only covered a small part of the globe. The lower lid was everted, and the conjunctiva red and much swollen. He was using a bandage, to protect the eye from the painful influence of light, air, and dust. Vision was nearly abolished, and scarcely any movement of the globe possible. A large, bony, hard tumor, covered with several irregular nodules, occupied the ordinary situation of the eye, raising the upper lid and eyebrow. The nasal fossa was pervious to air, the arch of the palate was normal, and there was no trouble on the part of the brain. Diagnosis, exostosis of the orbit, developing at the expense of the ethmoid. The idea of removing it *en bloc*, on account of its extreme size and hardness, was considered practicable. The operation—so rare and

difficult—was performed on the 5th of August. An incision was made, beginning just above the brow, running transversely inwards to the median line on the root of the nose, thence downward, along the right side of the nose. This large flap was dissected off with the periosteum, and the external face of the tumor denuded by the finger and the blunt closed scissors. A slight trial with mallet and chisel revealed the extreme hardness of the growth, and the impossibility of safely removing it in that way. In view of the fragile nature of the ethmoid from which it grew, it was thought possible to separate it in one mass. The chisel was placed in a fissure between the bones of the nose, the os planum, and the tumor. A few hard blows with the mallet loosened the mass, but without any sound of fracture. By then prying it out, little by little, from one side to the other, with the chisel, seizing it with a stout forceps, and using strong traction and rotation, the tumor came away suddenly, leaving an enormous cavity. The surgeon was much relieved, when he explored this with his finger, to find that it did not connect with the nasal fossa or the cranial cavity, and that the structures in the orbit had escaped serious damage. The eye was replaced, the long wound closed, and a retaining bandage applied. No violent reaction occurred, and in twenty-four hours most of the wound was united, the eye entirely retained in the orbit, and recovering its movements. Some suppuration took place for a few days, but the pus escaped easily, and injections of phenic acid were made. Improving daily, the cure was complete by September 1st. He completely recovered the use of the eye, but retained an extensive scar. The tumor was ovoidal, somewhat flattened, with the large end backward, having greatly dilated the cavity of the orbit. Long diameter 62 mm., transverse 40 mm., and vertical 70 mm.!! Weight 90 grammes! In section, the structure was as compact as ivory, of a milky-white color, and without any trace of vessels. The surface was nodulated, but smooth, excepting a rough fractured surface of four square centimetres, situated at equal distance from either end. This was the broken pedicle.

A third case is reported by Mr. Charles Higgins, of Guy's Hospital, in the *British Medical Journal*, p. 364, Sept. 1876. A. C., aged 17, came to the hospital for treatment Dec. 30, 1875. The father had noticed a protrusion of the right eye two years before, when his son complained of diplopia, after the fatigue of

reading. In Dec. 1874, a hard nodule was first observed, projecting at the inner margin of the orbit. Gradually the eye protruded, being displaced outwards and forwards, and the tears ran over the cheek. No pain or head symptom was present. When seen by Mr. Higgins, there was "considerable" prominence of the eye, which was pushed outwards, and a large, hard tumor showed at the inner angle of the eye. It was nodulated, and appeared to grow with a narrow base from the nasal process of the superior maxilla. The nasal fossa was not obstructed. The lids were stretched by the prominent eye, the puncta everted, — tears running over the face, — troublesome diplopia. The fundus oculi was sound, but $V = \frac{2}{5}$ only, while in the left it was $\frac{2}{2}$. Dec. 30, a vertical incision was made from the inner canthus to the upper edge of the tumor. The growth was found to be dense like bone, and had a narrow base attaching it to the inner wall and roof of the orbit nearly back to its apex. The tumor was chipped away with great care, to avoid fracturing the roof of the orbit. In the course of one hour and a half the larger portion was removed, and it was thought best to desist. The eye then returned nearly to its natural position. The edges of the lids were pared and stitched together, and the incision united with sutures, except at the lowest point. The structure was dense, like ivory, and the portion removed weighed $2\frac{1}{2}$ drachms (10 grams). On the fourth day there was some œdema of the upper lid, and loss of feeling in the region of the supra-orbital nerve. The wound was healed, except at the one point where it was purposely kept open by a tent. There was some discharge of pus, but no serious reaction. On the 25th of February the united lids were separated, and the patient was able at once to raise the upper lid fully, but rotation of the globe upward was limited. "Plenty of bare bone" could be felt through the fistulous opening. March 2d, movement of eye upwards improved, the fistula closed, and the patient was able to read Snellen No. $6\frac{1}{2}$. The feeling over the forehead was improved, but slight exophthalmos remained. The ophthalmoscope showed nothing wrong in the fundus of the eye.

The only criticism I should make in this case is, that I believe the method of separating the tumor in mass, as practised by Maisonneuve and myself, would have been easily accomplished and much less dangerous and tedious than so much chiselling. Besides, a part of the tumor remained, which may give rise to

troublesome exfoliation or to a renewal of the growth. I have written to Mr. Higgins to ascertain what has been the consequence, but have not had time for an answer.

The fifth and last case is found in the *Archiv für Ophthalmologie*, 1861, reported by Dr. J. H. Knapp. Patient, 14 years old, and in sound health, presented himself the last of July, 1860. Some nine months previously he was attacked with erysipelas of the lids, attended by marked protrusion of the eyeball. The swelling of lids and exophthalmos increased for twenty-four hours, then gradually abated, but the prominence of the eye did not entirely disappear. In three months a similar attack occurred, leaving the eye still more protruded. When examined, the upper lid and region of inner angle were somewhat swollen. The eye was pushed downward and outward, and very much protruded, the movements were limited in an upward and inward direction, but there was no paralysis of any muscle. With finger pressed between the globe and the upper margin of the orbit, a deep-seated tumor was felt in upper and inner part of the socket. Four weeks later, a movable, painless, slightly uneven tumor could be felt in the same region. Diagnosis—slowly progressing exostosis, on which two attacks of periostitis had supervened. The growth slowly increased till the 3d of February following, when an operation was thought imperative. A hard tumor was then felt at the upper margin of the orbit, irregular in form, and extending from the tendo oculi inwards to the upper and outer edge of the orbit. The finger could be pressed between it and the eyeball, as well as between it and the outer wall of the socket. The tendon of the trochlearis, tightly stretched over the anterior surface of the tumor, could be easily felt. All the movements of the eye were preserved, but limited upward and inward. The eye was natural, and No. 4 of Jager's tests could be read at four to eight inches. Now and then he suffered from moderate headache. An incision was made from near the ligamentum palpebræ internum, and extending along the supra-orbital margin to within 12 mm. of the outer commissure of the lids. The tumor, thus reached, was found hard and bony. The periosteum was separated from it as extensively as possible. It was impossible to get behind it either on the temporal or nasal side, on account of its firm connection with the bony walls of the orbit. Attempts were made by sawing to separate it along the orbi-

tal margins, but with little success. With chisel and hammer, only very thin scales could be chipped off, and care to avoid dangerous concussion of the brain had to be taken. First sawing a fissure and then chiselling, slow progress was made, till the growth, to the extent of 30 mm. wide and 18 mm. deep, was removed. It was then thought unsafe to pursue the attempts further. So the wound was united except at outer angle, and the eye closed by bandage. The whole operation lasted five hours. The case progressed rather well, and in a week the swelling of the lids began to subside, the eye remaining movable, and as before the operation. For seven weeks afterwards the patient did well. Brain symptoms then developed, and the patient died in spasms, followed by coma, on the 11th of April. The post-mortem showed that the exostosis grew from the frontal bone, and that death was caused by basilar suppurative meningitis extending into the ventricles. It would have been impossible to have removed the whole growth without opening the cranial cavity extensively and producing immediate death.

The study of these cases will show what a formidable disease an ivory exostosis of the orbit is, and the necessity of early surgical interference. Four of these five growths developed in the ethmoid bone, and three of them were capable of complete and successful removal. I believe, also, that Mr. Higgins might have taken the entire exostosis away by wrenching it loose in one mass, instead of trying to cut or chisel it away piecemeal. In Knapp's case this would not have been possible, and the course pursued was perhaps the only one that was rational, although it is a question whether it would not have been better to desist from the operation as soon as the great extent and solid connections of the tumor were certainly ascertained. The differential diagnosis between ivory and other forms of exostosis of the orbit is not easy. Indeed, it is usually not possible before the operation. As an illustration, I met with a case only last week, that possesses some points of special interest. A tall, well-developed, but scrofulous man, aged 17 years, suffering from a chronic catarrhal affection of his nose and throat, consulted me for a very troublesome epiphora of three years' duration. I found no evidence of dacryocystitis or stricture, and the position of the puncta was natural. Water injected through the lower punctum passed freely into the throat. But I was at once struck by the appearance of a fulness under the left tendo

oculi, which I recognized as an exostosis. It occupied the os planum as far back as I could press the finger, and seemed very hard. The thought came up at once, here I have another ivory exostosis just in time for my report! The patient was not aware, till I called his attention to it, that there was any growth there at all. I discovered that each time he blew his nose the skin was raised over the tendo oculi with an audible snap. Pressure with the finger removed it at once, with the peculiar feeling of displaced air. I first thought it was caused by air entering and dilating the tear sac. But water passed through the sac without developing any such swelling. So I knew that this subcutaneous space communicated with the air-passages of the nose or ethmoid. By pushing my finger deep into the orbit, displacing the eye outwards, and pressing against the tumor, which was roundish and slightly nodulated with great firmness, not the least yielding could be detected. The eye was not yet displaced by the growth, and was perfect in function and movements. The nasal passage was free, and I could pass a probe readily through the superior meatus. But the question was, why should the right eye weep as much as the left, when no fulness was noticeable on that side? By pressing the finger deep into the orbit following the inner wall, a hard, distinct nodule was felt far back. As it was very small I decided to leave it unmolested for the present. But the other would soon cause displacement of the eye and serious trouble. So, after full consultation with Dr. L. C. Ayres and Dr. Robert Sattler, my partners, I decided to operate. Provided with all the instruments that could be needed in any emergency, and having the patient fully under ether, I made a semicircular incision extending from the upper edge of the tendo oculi to a point just below the trochlea, and cut down to the bone and through the periosteum. Then, in attempting to detach the periosteum from the tumor on the ocular side with the handle of the scalpel, I crushed through the bony shell. The ethmoid cells were greatly dilated and easily broken down, and I could feel the mucous lining of the inner plate next the nasal fossa. With forceps, and chisel without mallet, I removed the extensive shell of bone, which extended nearly to the apex of the orbit, leaving only a little, sharp projection far back. But little bleeding occurred, and the eye and muscles were intact. The wound was stitched, except a point at the lower end through which a tent was intro-

duced into the large cavity. The operation was made Tuesday, the 27th of April. Swelling of the lids closed the eye in the next thirty-six hours, but no chemosis, exophthalmos, or other change in the eye or its muscular movements, took place, and there has been no constitutional reaction whatever. I shall complete the report of the case when the patient is well. It remains to be seen whether a similar development ever takes place in the other lateral mass of the ethmoid.

TEMPORARY BLINDNESS FROM QUININE.

By A. H. VOORHIES, M.D.,

MEMPHIS, TENN.

FEBRUARY 16, 1878, I was asked to see Miss V. H., a young lady, aged 18, living on the Arkansas side of the Mississippi, twenty miles below this city.

Arriving at the residence, I found the patient in bed, with every appearance of being extremely ill. The history, as briefly given by Mr. and Mrs. M., at whose house she was a visitor, was, that one week before the date of my visit, under the apprehension that this lady was threatened with a congestive chill, a relative who happened to come in (not a physician) caused an ounce of quinine to be administered to her within the space of a few hours; and that a like quantity was given each day for the two following days. In other words, more than thirteen hundred grains were given by stomach and rectum within three days.

On the morning of the second day it was discovered that she was perfectly blind.

At the time of my visit, which, as stated, was one week afterward, I found her extremely prostrate, hardly able to move her fingers, with feeble pulse, and barely able to comprehend the simplest question when addressed, while, heretofore, she was noted for sprightliness of intellect.

Audition was but slightly impaired, requiring no effort on the part of her friends to make her hear every word.

There was marked paleness of the face, and this was also noticed in the conjunctival lining of the lids. Pupils normal, responding promptly to light. T. 1: anæsthesia of cornea so as to suffer a probe moved about over its surface without complaint. No perception of light.

Ophthalmoscopic view very peculiar, disk perfectly white, not a trace of optic nerve vessels—neither veins nor arteries, choroïdal vessels empty, with pale yellowish tinge of retina.

Regarding the condition one of extreme cerebral anæmia, and acting on the hypothesis that amyl. nit. would cause distension of the arterioles, I directed its employment by inhalation.

There was a slight suffusion of the face, and perhaps some enlargement of the vessels of the ocular-conjunctiva, but not the slightest change in the intra-ocular vessels.

This was employed at intervals of four hours for four days, but resulted in no improvement. Stimulants were also freely used, but with no good. Tonics and nourishing diet were ordered, with rapid improvement of her general condition. Strychnine was used hypodermically, beginning with $\frac{1}{60}$ of a grain, and regularly increased until $\frac{1}{5}$ of a grain was reached three times a day. I will say that the most satisfactory physiological effects of this drug were obtained, but still no improvement of sight was discovered until the middle of the tenth week, when she was able to discern a trace of light on the use of the ophthalmoscope. The return of sight was very gradual until she was, and is now, enabled to read Jæger No. 1.

I had the opportunity of examining this case a few days ago, and find the disk perfectly white, with still no trace of central artery except a small twig, which is just perceptible as it struggles over the upper half of the disk of the left eye, to be lost on reaching the retina. The field of vision is greatly contracted, and in chalking it out at this time, I find the greatest, which is the vertical, diameter, to be less than four inches when taken at two feet. Her general health is good, and her mental activity is fully restored.

RELIEF OF XEROPHTHALMIA BY OPERATION.

By EUGENE SMITH, M.D.,

DETROIT, MICH.

BEFORE proceeding to the explanation of the operation, and report of the case operated on, a few remarks regarding the disease known by the above title may not prove mal-apropos.

By xerophthalmia we understand an atrophy, partial or complete, of the entire conjunctiva—palpebral and ocular—the consequence of a very severe ophthalmia, which has nearly or quite destroyed the secreting elements of the mucous membrane. It may be caused by burns, the action of chemicals, or imprudent cauterizations. The following case represents so clearly the characteristic features of the disease, that further preliminary remarks are perhaps unnecessary.

Mr. Felsky, aged 28 years, German, came to the Infirmary Feb. 24, 1878. He had suffered many years from granular ophthalmia. At the time of his entrance he could see to get around comfortably with his *left* eye, the cornea of which was but very slightly hazy. The conjunctiva was somewhat lacking in moisture; the retro-tarsal fold almost obliterated, and several fræna existed between the lower lid and the globe.

The conjunctival sac in the *right* eye was almost entirely obliterated, and perfectly *dry, like the cuticle*; the lids were adherent to the eyeball for about four-fifths of their depth. The cornea and entire surface of the globe and the inside of the lids were covered with epithelial-like scales, or yellowish scabs. Patient could discern the shadow of objects passed between the eye and a window, but could not do so with his back to the light. The eye was insensible to the touch, but the patient complained that the “pricking” and “burning” were at times insufferable, and begged for relief, even if enucleation was necessary.

The disease has been considered incurable, and anything looking toward its relief must be considered worthy of attention.

In the May number, 1876, of the *Royal London Ophthalmic Hospital Reports*, my friend, Prof. Buller, of Montreal, published an operation for the relief of this condition, and reports a case successfully treated. The operation consisted in scalping the edges of the lids, sewing them together, and *trephining* a small opening four weeks subsequently, in the upper lid in front of the cornea. Six weeks later, when the patient was discharged, the opening had contracted about one-half in size.

The operation which I have made is patterned somewhat after the one suggested and performed by Buller, and differs from it only in the method of getting the opening in front of the cornea, and one which will remain *permanently*; and in being made at one sitting, requiring but the one operation, whereas his method required two, which were made some four weeks apart.

The difficulty in maintaining a permanent small opening in soft parts like the eyelids, is a well-known surgical fact, and it has been asserted, I believe, and by good authority, that it is not possible. It is possible, however, as Buller's case and my own prove.

I proceeded as follows: Detaching the lids from the globe, I excised all the lashes of the right upper lid, including hair-follicles (scalping the lid, as it were); made a vertical incision about three lines long in the skin of the upper lid, over the cornea, extending from the incision at the edge of the lid, towards the eyebrow; dissected back the little flaps thus formed, and removed, with the scissors, a triangular piece of the upper lid, including cartilage and conjunctiva, the palpebral border forming the base of the triangle; the piece removed was about two lines in height, and at the base about the same in width. The flaps were drawn with sutures in such a manner as to cover the edges of the triangular opening, and, as desired, became adherent thereto. The edge of the under lid was freshened, except for a space the width of the base of the triangular opening in the upper lid, and the two lids were united with four sutures.

There was considerable swelling, but the parts healed well, except the outer half of the lid, which subsequently required refreshing and bringing together with one suture. This was owing to carelessness in bringing the freshened edges together during the first operation.

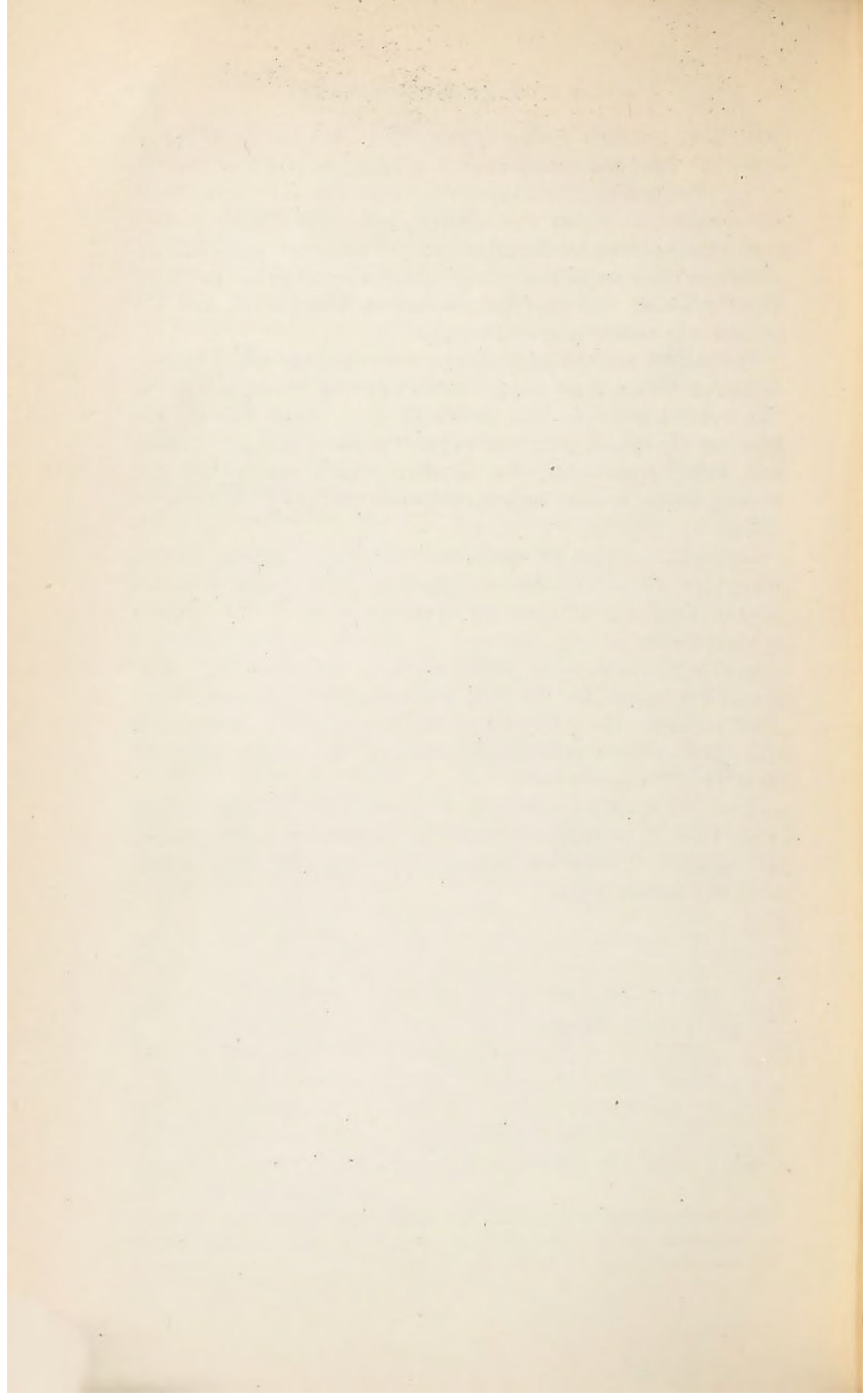
About one week after the operation, a small amount of yellowish mucus showed itself at the opening in the lid, and it

continued to collect daily. The eyeball seems to move freely under the lids; the cornea cleared up, and became transparent, so that five weeks after the operation he was able to see with this eye to walk about the hospital, and count fingers at two feet. The opening in the lid contracted in such a manner as to obliterate the apex of the triangle, becoming elliptical in shape. The "pricking and burning" sensations disappeared, and the patient was comfortable and happy.

The patient left the hospital about two months after the operation, at which time improvement was still slowly going on. The eyeball, however, had ceased to move freely beneath the lids, and the cornea remained exposed at the opening in the lid, and, being immovable, the secretion would accumulate and harden, unless it were kept moist, or occasionally wetted with milk.

Buller thinks that his operation, "trephining, is only suitable for typical cases, with firm tissues to work upon, and shrunken conjunctiva;" but I think the operation which I have related above suitable for any degree of the disease; in fact, the condition of my patient, when he left my care, was a positive indication, in my mind, for the early performance of the operation—that is, before the conjunctival sac is even half obliterated, or the symblepharon sufficiently extensive to interfere with the movements of the eyeball.

That the operation is worthy of a place in ophthalmic surgery, will, I think, be freely admitted by all, because in two cases—Buller's and my own—it has partially, at least, restored the function of a useless organ.



A BRIEF EXAMINATION INTO THE COMPARATIVE
MERITS OF SOME OF THE OPERATIONS FOR THE
EXTRACTION OF HARD CATARACT, WITH RE-
MARKS ON THE OPERATIONS PROPOSED FOR
THE RELIEF OF CERTAIN CASES OF LAMELLAR
OR ZONULAR CATARACT.¹

By B. A. POPE, M.D.,

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For a long period the large corneal flap operation superseded all others for the extraction of hard cataract. In the whole of surgery there is no operation more beautiful, and when successful more satisfactory.

As soon as an operation has been proposed to replace the old corneal flap operation, whether it was that for linear extraction, combined with the use of traction instruments, or the modified linear extraction of Von Graefe, all have entered with enthusiasm into the new paths pointed out by such masters in eye surgery as Bowman, Von Graefe, Critchett, and others. It required but a short time for us almost to forget the old corneal flap operation. Such extreme revolutions are rare, except in medicine and surgery, where no great material interests are obviously involved. It was in England that the revolution against the large corneal flap operation began, and it was perfected in Germany by Von Graefe, whose energy and mental force were destined to give universality to the revolution.

When I look back and recall the impressions made upon me when witnessing the operation for the extraction of hard cataract by the large corneal flap in the clinics of Sichel the elder, of Desmarres the elder, and of Von Graefe, the contrast is very striking.

When I entered the clinic of Sichel for the first time, he was

¹ The loss of my notes of cataract cases for a period of fifteen years hinders me from carrying out my original intention of a statistical comparison of the various methods for the extraction of hard cataract.

upon the point of operating by the upper corneal section. The patient was standing facing a window. Sichel, taking the knife in his right hand (operation on the left eye), opened the eyelids with his left. There was no assistant to hold the eyelids, and he did not fix the eye. Puncture having been made, the knife was pushed rapidly forward. The cornea disappeared almost entirely behind the inner angle of the eye; but this did not retard the counter-puncture, which having been made, the cornea was made to present in front and the section was completed. The lens capsule was ruptured with the knife before it was finally withdrawn, and the lens was evacuated with the greatest ease. The lids were at once closed without disturbing the flap. Immediately after, examination having shown that there were some capsular opacities, the operator, taking an iris forceps, opened the eyelids as before, and, by a dexterous rotary movement of the forceps, removed a considerable piece of the anterior capsule, and left the pupillary space perfectly clear of opacity, without causing escape of the vitreous humor. The whole operation was a masterpiece of cool skill and remarkable manual dexterity. It was evident that from this operator we could not expect a change from this grand old operation, which must ever remain a monument to those who introduced and perfected it.

In the clinic of Desmarres there were several material points in which the operation differed from the one just described. Both the patient and the operator were seated, the eyelids were held open by a trained assistant, either with his fingers directly or with the solid lid holders (elevators). The upper section was invariably performed, and the eye was fixed with the pique of Pamard. The knife was withdrawn in most cases before the completion of the flap, and the flap was then completed by a knife which was a combination of cystitome and knife, so well known as not to require description. In completing the section a small portion of the conjunctiva was generally included in the flap at its apex. Throughout the operation a higher degree of caution was manifest.

In the clinic of Von Graefe the patient was in bed, the eyelids were held by an assistant, a fixation forceps was used, and everything showed a still higher degree of caution in the operator. Von Graefe, making use of the suggestions derived from what had been done in linear extraction and the application and per-

fection of traction instruments by his English colleagues (Gibson, Travers, Bowman, and Critchett), advanced step by step till he perfected his operation for modified linear extraction.

Practically this is a new operation, and whether finally accepted or not as the most practised for the extraction of hard cataract, it will ever remain a model work of genius, and worthy to be, from its originality and variety of new ideas, the last work of his great career.

Soon after Von Graefe gave the results of his labors upon this point to the world, so great were his genius and personal influence that not to operate according to his method became exceptional.

Hardly had the acute sense of loss that we all felt when he was taken from his labors been softened by time, before from all sides, and even issuing from his own scientific household, came propositions to introduce new operations, or to introduce modifications in the strict method of Von Graefe or in some other operation.

What is the cause of this? There is no doubt that the answer is to be found in the fact that no operation can be invented so perfect that very serious objections may not be urged against it, and that will not at times give a good operator a series of imperfect results. The operation of Von Graefe was perfected as far as his genius and practical skill could make it so, and the tendency to depart from it, after having been introduced and practised by such a master, shows its inherent defects. I will venture to assert that few operators have ever obtained such good results by the operation of Von Graefe as did Von Graefe himself.

One great objection to the modern search after a cataract operation is the demand for one which shall be of almost universal application. This is one of the prominent claims for the modified linear extraction of Von Graefe, and for the operation of Liebreich. It seems to me that we should rather specialize the application of operations. This is certainly the course most likely to cultivate many-sided skill and lead ultimately to more perfect results.

The Large Corneal Flap Operation.

At present there is no difference of opinion as to the propriety of fixing the eye when making the section for cataract extraction, no matter what the method of operation may be. The method

of fixation, in my opinion, should depend upon the method of the operation. The pique of Pamard as used by Desmarres the elder is best adapted for fixing the eye in case the large corneal flap operation be the one chosen. The fixation forceps causes much more resistance, voluntary and involuntary, on the part of the patient. The conjunctiva is often torn or displaced from its natural relations, and the trauma at times causes considerable subconjunctival hemorrhage. These facts are not without influence upon the subsequent course of cases where the nutrition of the cornea and of the conjunctiva is defective.

The fixation forceps is less objectionable where the patient is well under the influence of an anæsthetic or is very quiet without the use of one, and the eye is not irritable. The fixation forceps seems specially adapted to the operation of Von Graefe. Any one who has witnessed the operations of Desmarres, who used the pique of Pamard, cannot have failed to be struck with the greater amount of resistance caused by the use of the fixation forceps. Everything is now based upon the idea of the necessity for extreme caution, which may be carried so far as to defeat its own objects. The fixation of the eyelids is best accomplished by the fingers of a trained assistant.

I have found many patients to resist violently the combined use of the fixation forceps and the stop-eye speculum. I do not like the use of the stop-eye speculum under any circumstances in the operation for cataract extraction, since it is liable to produce violent involuntary and voluntary contraction of the recti interni muscles and of the orbicularis palpebrarum. It is always liable to press upon the eye and to increase the dangers of the operation.

It appears to me that if the large corneal flap operation is to be retained in eye surgery, the pique of Pamard and the fingers of a trained assistant are necessary to a fair examination of its relative merits. Great tranquillity in both patient and operator is indispensable, and a proper holding of the eyelids and comfortable fixation of the eye are essential to both. These two points are by far the most difficult, and, if properly executed, rarely is there notable danger in the remaining steps.

It is not intended to deny that there are patients who bear very well the use of the fixation forceps, yet there are so many exceptions that it would seem to me to be best to use in all cases the pique of Pamard.

The knife of Sichel is perhaps the best for forming the flap, though I have frequently used one a size smaller.

During the formation of the flap, and subsequently, I have never seen a mishap except where the assistant holding the lids was untrained.

I would lay it down as an axiom that the danger of the loss of vitreous humor is small—very dangerous when it occurs, but seldom fatal in its effects.

During the completion of the flap there is danger of prolapsus of the iris, but this is not a matter of much importance, since at this stage of the case it is easily reduced, as also immediately after the evacuation of the lens.

We may have hemorrhage as a result of the evacuation of the aqueous humor. I have, however, never seen such a case except as a consequence of the evacuation of the vitreous humor by the pressure of the fingers of the assistant upon the eye. Such cases, however, are recorded, and the eye may be lost at once by the accident. Such cases must be extremely rare, and there must be something about them to indicate the danger.

The laceration of the lens capsule and the evacuation of the lens are of easy performance, in my experience to the iris but little trauma and almost none to the cornea.

The total evacuation of the lens substance is more easy in this operation than in any other, which all must admit to be a matter of great importance.

A light dressing after the method of Desmarres is now all that is necessary.

Great care, greater than in any other operation, is now necessary for forty-eight hours. This is in many respects an advantage, since it insures the closest attention on the part of all concerned.

The wound does not as a rule heal so soon as in other operations, but this, in my opinion, is an argument in favor of the large corneal flap operation in this, that it diminishes the danger of inflammation of the iris.

Before the closure of the wound there is a constant accumulation and escape of the aqueous humor, which becomes turbid from macerated lens substance, almost always left to some extent after the operation.

The constant escape of this turbid aqueous humor, I believe, has a most conservative tendency, and this fact stands

in strong opposition to the efforts made by the modern school to hurry the closure of the wound.

Prolapsus of the iris, according to my experience, is less frequent in this operation than in any other, not only during the operation, but also during the period of healing. It has so happened that I have never seen such a case during the period of healing except in cases where the section has been made farther back than the strict rules for the performance of this operation demand. Where it has happened I have as yet seen no bad result, except a retardation of the cure, without inflammation.

No case of hemorrhage subsequent to this operation has occurred in my practice.

In my experience iritis as a consequence of this operation is less frequent than in any other. In fact I never saw a case of a bad form of iritis or of irido-cyclitis as a result of its regular performance. The comparative infrequency of iritis may be accounted for by the longer and freer escape of aqueous humor, by the lesser degree of trauma to the iris and cornea, the absence of blood from the anterior chamber, the smaller laceration of the capsule of the lens, and the absence of a fresh wound of the iris.

The great danger of this operation is considered to be the liability of the cornea to suppuration. This is, in my experience, the least of its dangers, being a less frequent occurrence than in any operation I have ever performed. When I assert this as a fact I am disposed to do so very guardedly—thinking it probable that this may be true for this region of country in a higher degree than for any other I have had occasion to study in this relation. It has appeared to me that as a rule all incised wounds do well in the Mississippi valley. I have understood this to be the opinion of practitioners of general surgery. I think that I can assert as a rule that this is true for all incised wounds of the eye. It certainly will not be asserted that other operations for cataract extraction are free from this tendency to suppuration of the wound. Where great care is used in selecting cases to be operated upon by this method, I think that the percentage of loss from this cause may be greatly reduced. Since the results in successful cases operated on by this method are so highly satisfactory, and the cases in which we have reason to apprehend danger are generally so well marked, it appears to me that this operation should not be rejected without farther comparative trial.

All oculists agree that a case operated upon by this method with complete success gives us the standard by which all other cataract operations are to be judged.

If it were not announced that such an eye had been operated upon, none but experts would detect it, and they only after examination. Cosmetically considered, then, we have a perfect operation. This fact alone has driven Liebreich, Von Wecker, and others to reject iridectomy from their cataract operations, and in this I heartily agree with them, for it is simply unscientific to destroy such a beautiful organ as the iris for what in most instances I believe to be an imaginary good and which is often a real evil.

Optically it is of great importance to preserve the central freely movable pupil.

As to the performance of the operation I think that it is the easiest of all the operations for hard cataract. I wish to establish the fact that it is an easy operation to perform, that the cases in which it presents special dangers are tolerably well known to the profession, and that we have choice of operations to supersede it.

The English school has left this operation a place. The continental schools have almost entirely rejected it. The Desmarres (father and son) are almost the only men of prominence on the continent of Europe who have adhered to this operation. They were extremely careful in their choice of cases, and their results were certainly admirable.

This operation has given me the best results in every sense, and, though this may be owing in part to local influences—which certainly often determine the success or failure of operations—still the difference has been so marked as to influence me to write this paper in order to make a plea for its revival.

The Operation of Von Graefe, or the Operation for Modified Linear Extraction.

The great objections to this operation are: 1. The great periphericity of the section. 2. The large excision of the iris, which is the necessary consequence of the first step.

All the dangers and evils of this operation grow out of these two steps which are its fundamental ideas, and upon which are based the hope of escaping the evils incident to the large corneal flap operation.

That this operation has not served to cure the evils of the corneal flap operation no one will deny, and that it has introduced difficulties and dangers almost unknown to that operation is equally certain.

In the hands of any but the most skilful operators it is fraught with dangers far beyond those incident to the corneal flap operation.

The wound, the outer lip of which lies in the sclerotic coat, and which is as nearly linear as possible, is so far back that the section is the most difficult to make well and the most liable to be attended by accidents.

The excision of so large a portion of the iris would probably at any other period of the history of the operations for cataract extraction have been an insuperable objection to this operation. At this time, however, the mind of the profession was impressed by the remarkable curative effects of iridectomy, and consequently easily accepted an operation demanding the sacrifice.

It is true that the danger of suppuration of the wound may have been diminished, but the danger still remains, and I have seen, in the best operated cases, in patients who presented no objections to any operation upon the eye, the most rapid development of panophthalmitis. It is said that this occurs only half as frequently in the operation of Von Graefe as in the large, conical flap operation. This I consider to be very doubtful, and it is probably only true of a few of the best operators.

The position of the wound, and the necessity for fixing the eye throughout the whole of the operation, render the danger of loss of a portion of the vitreous humor very great.

Prolapsus of the iris as a rule takes place during the making of the incision or at its completion. It is usually extensive, and precedes the iridectomy. This I consider to be a matter of importance, since it is very difficult to completely reduce the iris to its natural relations when once extensively displaced and then cut. It may appear replaced, but I think that as a rule it will be found that it becomes permanently engaged in the extremities of the incision when once extensively prolapsed.

It seems to me that the antiphlogistic power attributed to the excision of a portion of the iris has been exaggerated, and that, in fact, it may be a source of inflammation in some cases. Sometimes a simple iridectomy will result in iritis, and I have seen a case of panophthalmitis as the result of a simple iridectomy.

The location of the incision leads often to troublesome hemorrhage into the anterior chamber from the conjunctiva and subconjunctival cellular tissue.

The wound in the iris not infrequently leads to troublesome hemorrhage from that membrane during the operation, and in several cases I have had troublesome hemorrhage from the thirty-sixth hour up to the sixth or seventh day.

The position of the wound, the cutting of the iris, and the extensive laceration of the lens capsule combine to cause, in my experience, more frequent and more troublesome iritis than occurs usually in the old corneal flap operation.

The portion of iris in case of prolapsus being far back towards its ciliary attachments is liable to lead to bad forms of iritis and irido-cyclitis.

The position of the wound being placed far back, the evacuation of the nucleus and cortical substance, especially the latter, is rendered difficult. The presence of blood adds to the difficulty and danger still more.

The pressure of the curette upon the cornea directly, and indirectly upon the iris is not a matter of indifference. I have frequently seen the pigment of the iris flow from the wound freely with the soft cortical substance and aqueous humor. I am satisfied that some of the unexpected misfortunes following this operation are to be attributed to the bruising of the iris in this manipulation.

If no lens substance nor large amount of blood be left in the anterior chamber, the rapid healing of the wound would probably be no disadvantage. But this cannot be asserted of the majority of cases operated on by the method of Von Graefe.

It has seemed to me that acute changes in the cells of the anterior capsule of the lens occur oftener in this operation than in any other. This may be caused by the modern tendency to operate on hard cataracts before maturity, or may be in part the consequence of the too extensive laceration of the capsule of the lens, combined with the fresh wound in the iris.

The excision of a portion of the iris, and the extensive rupture of the capsule up to the equator of the lens, expose the cut surface of the iris and of the ciliary region to irritation from the macerating lens substance, and render possible the healing of the capsule in the corneal wound.

If wounds in the sclerotic coat heal better than those in the

cornea, I cannot understand the necessity for compresses and bandages in the after treatment of this operation.

I think that I can say without injustice that this operation is the most complicated and difficult of all those now practised for cataract extraction.

From a cosmetic point of view this operation can but be condemned. In light colored, prominent eyes this amounts to a real deformity. It is true that by operating upwards the bad effect is diminished in some cases.

Considered from an optical point of view the defects of this operation are decided. The blinding effect of strong light in some cases is so great that the patients resort to extreme measures in order to protect themselves. The large pupillary space is often to a great extent filled up with translucent capsule or more or less dense membranes, which cause a most disagreeable dispersion of light, not to speak of their influence upon the acuteness of vision.

I have never seen a case operated on by the method of Von Graefe use the eyes on all occasions and for all purposes with the same ease and comfort as in the successful cases of the corneal flap operation.

As a rule, it has been true in my practice that cases operated on by any method demanding excision of the iris require stronger cataract glasses than where the iris has been untouched. This fact is of great importance in respect to the strain which necessarily falls upon the recti interni muscles in reading or doing fine work, and has more than once forced me to a division of the tendon of one of the recti externi muscles.

In case corneal astigmatism be marked, an extensive iridectomy cannot fail to be a disadvantage.

The Operation of Von Mooren.

This operation has, it appears to me, two disadvantages. It requires two operations to be performed at an interval of several weeks. An iridectomy having been first performed, it seems that the corneal flap is unnecessarily large. I have had some excellent results after this method, but it is also subject to many of the objections which hold against all the operations for cataract extraction, combined with iridectomy.

The Sclero-Corneal Flap Operation.

Since the year 1864 I have performed this operation, combined with iridectomy, in every possible way. I have for some years definitely chosen this operation in the place of the operation of Von Graefe, whenever the large corneal flap operation may seem to be contraindicated.

The incision has a length usually a little more than one-third the circumference of the cornea. The iridectomy is usually small. The smaller (lower) the corneal flap the larger must be the iridectomy. In the large majority of cases I make the operation upwards. This operation has nothing essentially different from that of Critchett and others, and I propose no claim for originality.

The fact that the section in this operation lies so much farther forward than in that of Von Graefe relieves it of many of the dangers of that operation. The size of the iridectomy is also much more in the choice of the operator. The loss of vitreous humor is extremely rare, and hemorrhage into the anterior chamber is much less frequent than in the modified linear extraction. Iritis is more frequent in my experience than in the large corneal flap operation, but the form is as a rule milder than in the operation of Von Graefe. The tendency to suppuration of the flap is very slight. Prolapsus of the iris occurs not infrequently, but the irritation growing out of this occurrence is not usually great, since the ciliary and pupillary portions of the iris are rarely involved.

This operation can be said to be one easily performed in every respect, and no wound for cataract extraction heals better.

De Wecker and others have proposed to perform this operation without the iridectomy. The iris is reduced by means of a spatula, and kept in the anterior chamber by means of eserine.

This operation does not appear to me to be free from danger growing out of the bruising of the iris during the evacuation of the lens, through the pupil and a corneal opening placed so far back. I have not tested this operation as yet sufficiently, however, to form a correct judgment of its relative merits.

The Operation of Jacobson.

The large section in this operation is made downwards in the sclero-corneal junction, and is combined with a large iridectomy.

This operation is liable to several objections, though giving,

no doubt, good results as far as freedom from dangerous inflammation of the iris and suppuration of the flap are concerned.

I am disposed to believe that a smaller section upwards, with a smaller iridectomy, might give equally good results in respect to the occurrence of inflammation, and much better results as to comfort and acuteness of vision.

The Operations of Liebreich and Lebrun.

Liebreich, in speaking of his operation, says that the superiority of the successful cases of corneal flap extraction over the successful cases operated on by the method of Von Graefe, led him to seek a new way by which the iris might be preserved intact, and yet have the wound to heal with equal facility.

If all that the author claims for this operation be confirmed by the experience of others, it is destined to replace all others for the extraction of hard cataract.

That it is possible to perform the operation of Liebreich according to the rules laid down, and to escape the prolapsus of the iris and other mishaps incident to cataract operations, I know to be true. Where this is the case, there is no doubt of the superiority of the results over those of the operation of Von Graefe. The question, however, is not as to the possible successful performance of this operation, but as to the chances of its being done successfully in a large percentage of cases by a number of operators of varied skill. To me it appears that in a large number of cases prolapsus of the iris will take place, and thus render it liable to be bruised while it acts as a hindrance to the exit of the lens, and especially of the cortical substance.

Since the healing of the prolapsed iris in the corneal wound may change the curvature of the cornea, the fact that the apex of the wound is so near to the pupillary margin makes the prolapsus a matter of great importance from an optical point of view. Suppuration of the wound and opacity of the cornea would add to the difficulties. The close proximity of the points of puncture and counter-puncture to the ciliary attachments of the iris is of importance, since a prolapsus of the iris at these points is very dangerous.

The operation of Lebrun does not differ very essentially from that of Liebreich. The puncture and counter puncture being made in the operation of Lebrun in the sclero-corneal junction, the danger to the ciliary portion of the iris is not so great as in

the operation of Liebreich. The operation of Lebrun being made upwards gives it some advantage in case of change of curvature of the cornea. Both operations seem to me to be so imminently threatened with prolapsus of the iris that I prefer to go back to the old corneal flap operation rather than try to escape the sacrifice of the iris by their means.

I have several times tried the following methods of operation in order to save the iris and to escape the danger of suppuration of the cornea incident to the old corneal flap operation. As far back as the year 1864 I commenced to modify the old flap operation. At first I made puncture and counter-puncture as usual in that operation, only a little higher up, and the edge of the knife being directed a little backwards, the apex of the flap would fall in the sclero-corneal junction. Making farther experiment, I found that I obtained more satisfactory results by making puncture and counter-puncture in the sclero-corneal margin, and a little higher up (upper section) than in the old corneal flap operation. The edge of the knife being directed a little forwards, the apex of the flap fell in the cornea about $\frac{1}{2}$ mm.— $\frac{3}{4}$ mm. within the transparent cornea. This operation has given very good results, but I am as yet unprepared to express a decided opinion as to its comparative merits.

The Operations upon the Iris in Stationary Zonular or Lamellar Cataract.

Several years since, I published in *Knapp's Archives* a short paper describing an operation upon the iris which seemed to me to be fit to replace the operation of Critchett for displacement of the iris, against the latter operation objections having been raised. As I have had occasion to farther test this operation, I take occasion again to call attention to its merits.

This operation, and all others on the iris, are applicable only to the stationary cases of this form of cataract, where the lens substance between the equator of the cataract and the equator of the lens is so transparent as to give good sight when the pupil is dilated.

Originally these cases were operated on by the ordinary method of iridectomy. Critchett's operation for displacement of the pupil was a great improvement on this operation when considered solely from an optical point of view; but experience has taught that displacement of the pupil rendered the eye liable to attacks of irido-cyclitis.

I performed the operation of Critchett several times without bad effects, but—objection having been raised—I prepared an operation to supersede it.¹

In favor of this operation it may, I think, be claimed:—

1. That it is easily performed:
2. That optically it is only inferior to the operation of Critchett:
3. That it is superior to the operation for iridectomy as usually performed:
 - (1) Because the cataract may not be more exposed to the light than before the operation;
 - (2) When the eye is exposed to a strong light, the pupil contracts well;
 - (3) From a cosmetic point of view, this operation is more satisfactory than an ordinary iridectomy;
 - (4) The worst result that can follow the attempt to perform this operation is the formation of a small iridectomy of the ordinary kind.

I have never tried to perform the operation of Bowman, in which he divides the iris from an opening in the margin of the cornea, and introduces a probe-pointed knife, and cuts the iris against the cornea, leaving the pupillary margin untouched.

If the cut surfaces of the iris should separate well, and inflammation not follow, this may be a good operation. I have not performed this operation, nor have I seen any reports on the subject; consequently, I have not been able to form an opinion on the subject.

In concluding this paper, I here avow that its motive has been to call attention to the large corneal flap operation and its modifications, since it seems to me that it offers the best solution of the hard cataract problem. In addition, I have wished to offer my testimony to the superiority, according to my individual experience, of the sclero-corneal flap operation, with iridectomy, over all other operations, combined with iridectomy, which I have tested.

I have regretted much the loss of details of all my cases, except those of the last two and a half years, since I have been deprived of the exact basis for the above opinions.

¹ See pp. 87-94, Nov. 7, vol. ii. of Knapp's Archives of Ophthalmology and Otology—"Iridectomy without Division of the Sphincter Pupillæ."

A REPORT OF ONE HUNDRED AND EIGHTY-FIVE CATARACT OPERATIONS, WITH SOME SUGGESTIONS AS TO CERTAIN MODES OF OPERATING, AFTER TREATMENT, ETC.

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IN most of the reports from different operators upon cataract operations, the linear extraction is the one most usually adopted, and for the reason that this method still offers the best assurances of success, I have also been led into its adoption, modifying, perhaps, certain points here and there, to meet sudden necessities that may have arisen in different cases.

It should be mentioned just here, that not all of the one hundred and eighty-five operations were extractions, but a small portion of them—in children, for instance—come under the head of discision (or laceration). Extraction having been made in the large majority of cases, and also being the operation applicable to the disease in adults—in whom cataract most usually occurs—it is desirable to give it the most prominent place in this report, bringing in the other (the laceration) in its proper turn.

I trust it will not be out of place to note, what experience has taught me to be of special service in going through the different steps of the operation, for, after all, it is in taking care of the little things, that much of the success attending this operation must depend. One who has not accustomed himself to operating with each hand, cannot properly appreciate the advantages had by him who is ambidexter in such operations. The real comfort of knowing that, being able to operate with either the right or left hand, will spare you many an uncomfortable position, and many an unskilful assistant, is sufficient reason for undergoing much wearisome practice in order to gain such manual dexterity.

I have found, that sitting in front of the patient, upon the

edge of the bed, and operating upon the left eye with the right hand, and the right eye with the left hand, is by far the most convenient position, both for the operator and the patient. The assistant then stands behind the head, and is entirely out of the way. But it is extremely desirable to dispense with the help of an assistant as much as possible, for obvious reasons. To accomplish this, needs only a fair trial on the part of a careful operator. The patient should occupy, during the operation, the same bed he is expected to remain in afterwards. This rids the operation of much unnecessary trouble and danger, which often accompanies the removal of the patient from the operating couch, or from one room to another. It requires no small amount of practice to enable one to make the operation, in all its details, exactly as laid down and practised by Graefe; therefore, the various modifications oftentimes mentioned in many of the reports of extraction of cataract.

As being of immense importance to the complete success of the operation, the utmost attention should be given to the formation of the conjunctival flap, and the making of the iridec-tomy. As the knife is brought out above, just behind the corneo-sclerotic junction, a fold of conjunctiva is caught upon its edge, and a small flap formed, the value of which cannot well be over-estimated. After the termination of the operation, the early healing of this external cut is very essential to the rapid recovery of the case, and, to a great degree, to the success of the operation. The conjunctival flap, when replaced, overlaps the wound upon the border of the sclera, heals by first intention, and keeps the parts in perfect apposition. Not unfrequently, on the day following the operation, the flap is found firmly united. Another advantage in the conjunctival flap is, that it prevents the slight, but constant, outflow of aqueous humor through the wound, which sometimes takes place where no flap has been made, thus interfering with the refilling of the anterior chamber. Occasionally, there is a tendency in the vitreous humor, especially when very soft, to protrude into the wound, and retard its healing, or act as a source of inflammation. The conjunctival flap offers a direct barrier to such a complication, and is therefore an additional assurance of recovery without undue inflammation. As Prof. Knapp very properly remarks: "It enjoys similar advantages to the subcutaneous division of tendons, or the fracture of bones unaccompanied by injury of the skin."

Without the formation of this flap, an important part of the operation is lost, and with it goes much that contributes to its ultimate success.

In entering the point of the knife into the anterior chamber, should it be caught in the iris, it is well to withdraw it until it is entirely free or disentangled, before passing it across to the counter-puncture; for so little of the aqueous humor escapes, that there is no interference with the movements of the knife. Many authorities insist that the knife should not be withdrawn, when once within the anterior chamber, until the termination of the incision; but almost every operator has doubtless noticed that a strict observance of this advice has more than once led to a result which at least delayed, if not directly injured, the successful ending of the case. To continue pushing the knife forward, after its point has fastened in the iris, not unfrequently tears it loose from its periphery, to a considerable extent (irido-dialysis), thus inducing such hemorrhage into the anterior chamber as to embarrass the further progress of the operation to no small degree. Sometimes there is secondary hemorrhage from the same cause, which gives quite a good deal of trouble, and can become the source of severe inflammation. The withdrawal of the knife's point, to the extent of its disengagement from the iris, is done without the least danger, and is very essential to the satisfactory continuance of this step of the operation.

After the *counter-puncture* has been made, if the iris *then* falls over upon the cutting edge of the knife, the incision should be continued, notwithstanding a piece may be clipped out as the instrument makes its exit at the sclerotic border. This may produce slight hemorrhage, but nothing compared to that which follows the tearing loose of the periphery of the iris.

If blood flows from the cut in the iris, it should be removed from the anterior chamber at once, as clotting takes place in a few minutes, making its removal very difficult and somewhat hazardous. This is best done by pressing backwards the sclerotic edge of the wound with a Daviel's spoon, thus allowing the re-accumulated aqueous to flow off and wash the blood out with it. According to my experience, hemorrhage following the iridec-tomy is by far most frequent and most severe in old persons, due perhaps to a want of contractile power in the vessels, and, when at all excessive in such individuals, is rather indicative of a tendency to dangerous inflammation. If possible, it is best to

make the iridectomy without the aid of an assistant, as he may exercise too much tension or pressure upon the ball, at the very moment when there should be none. With the eye turned downwards and the iris drawn out through the wound to a sufficient extent, one single cut, with the scissors laid flat upon the ball, will make a large regularly formed iridectomy.

The capsule of the lens should be freely opened, which is best done by passing the cystitome through the capsule in four directions, cutting it in the shape of a square, as it were. Under such circumstances a large portion of it comes away with the lens, but, if it is not sufficiently divided, not only is the delivery of the lens made difficult, but the entire partially divided capsule itself, or more or less of it, with portions of the cortical substance of the lens, remains behind and can become the source of secondary cataract. It is an easy matter, by a little unskilful or careless pressure, in the rupture of the capsule, to dislocate the lens to such a degree, that an escape of vitreous humor follows, and sometimes accompanies the attempt to force its exit. Should such a complication take place before the delivery of the lens, the spoon should be at once passed into the eye behind the lens, and the latter gently but quickly lifted out. Experience has taught me, however, that the introduction of instruments into the interior of the eye with the view of removing the lens, or any remnant of it, is always a serious matter, and should be avoided when possible. Another point of importance is worthy of special attention, viz., the replacement of the iris. After the iridectomy and the removal of the lens, the cut edges of the iris are very often caught in the lips of the corneo-sclerotic wound, and held there during the healing process; thus not only drawing the pupil far up towards the corneo-sclerotic border, but exercising a constant traction upon the iris itself, and acting as a prolific source of iritis, which so often endangers the success of the operation. The replacement is sometimes easily accomplished by rubbing the upper lid, with a sort of rotatory movement, over the region of the wound, after the withdrawal of the lid-holder or speculum, and giving a little time for the reaccumulation of a certain amount of aqueous humor. Or, if this should fail, introduce a flexible probe-pointed stilet, bent at the most convenient angle, into the wound, and gently detach the portions of iris from the corners, where they are most usually caught. This is a perfectly safe procedure, and is done

without fear of irritating the parts, and rids the operation of a very frequent cause of failure.

The Different Operations.

Of the 185 operations, there were 134 linear extractions, made according to Graefe's method, and 1 extraction made by the old flap operation, and 1 couching operation. The remaining 49 were in children or young persons, and discision (or laceration) was practised upon them.

Of the 135 extractions (including the one made by the lower flap operation) the progress of 102 was perfectly normal, nothing whatever interfering with a quick recovery and good vision. The causes preventing the normal healing of the remaining 33 extractions are as follows:—

Eight had iritis, in part due to remnants of the lens having been left behind, resulting in secondary cataract,—one recovered with almost normal vision. Upon three *iridotomy* was subsequently successfully made, giving them vision equal to $\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{5}$. The same operation was made upon another, but not sufficiently, and hence without success. In the remaining three, the thin pupillary membrane was broken up by the needle, resulting in vision equal to $\frac{1}{6}$ in two, and $\frac{1}{3}$ in the other.

Nine had plastic iritis, with more or less complete closure of the pupil. Of these, two had vision equal to $\frac{1}{20}$, which can be much improved by a subsequent operation. Another can only distinguish large objects, on account of the extension of a large pterygium in front of the pupil. A second operation will also here materially increase the vision. Iridectomy was subsequently performed upon four, giving them vision equal to $\frac{1}{10}$, $\frac{1}{30}$, $\frac{1}{40}$, $\frac{1}{40}$. Unsuccessful *iridotomy* was also made upon another, but no reason exists why a subsequent operation may not restore the vision to some degree. Upon the ninth an iridectomy was made, but to no purpose.

One received a blow on the eye on the fourth night after the operation, resulting in partial rupture of the corneo-sclerotic wound, slight iritis, etc. No test was made upon the discharge of the patient, but he now has very good vision, being able to use the eye quite well, even attending to his own business (planting).

One died six hours after the operation (which was performed with ease and perfect success) from supposed apoplexy.

Four were made in cases where the cataracts were secondary and due to irido-cyclitis, and hence, strictly regarded, should not be classed amongst the other extractions, but for a better location they are placed here. In each case moderate vision was at first obtained, but, the pupils becoming again closed by a slow subacute irido-cyclitis, this gain in sight was subsequently lost, and nothing further was attempted.

One had prolapse of the iris, the result of straining, drawing the pupil far up underneath the upper lid. The prolapse was clipped off and an *iridotomy* made, leaving vision equal to $\frac{2}{3}$.

Seven had suppuration of the cornea, totally destroying the vision, which immediately after the operation was tested and found good. They were aged respectively 36, 62, 67, 75 (in two) 77, and 84. In this number is classed the extraction made by the old flap method. The cataract in one case was traumatic, which may in part account for the tendency to suppuration. There was but little or no shrinking of the globe (*phthisis bulbi*) in either case.

One had traumatic cataract, with extensive opacity of the cornea, the result of a powder explosion. For a while after the operation the patient had vision equal to $\frac{1}{100}$, but the corneal opacity increasing, he is now only able to count fingers immediately before him.

One was lost from panophthalmitis.

Of the forty-nine operations by discision or laceration (mostly in children) the cure of forty-five was without the least disturbance whatever, with more or less improvement in vision in each, the exact test of which, however, could not be obtained in all (but an estimate has been made), on account of their age in some instances, and their want of intelligence in others.

Of the remaining four that healed abnormally:—

Three had partial suppuration of the cornea, beginning around the puncture from the needle. Of these, two can no doubt be yet restored to tolerable vision by making an iridec-tomy behind the clear portion of cornea and removing the rem-nant of lens. The other was in a person addicted to drink, who, by continuing his habit, has kept the eye in a constant state of irritation, rendering the propriety of a second operation very doubtful. Their ages are 15, 18, and 27.

One had suppuration of the entire cornea, beginning, as in the other cases, around the needle puncture, resulting in complete

sloughing of the cornea up to the sclerotic border. There was, however, no shrinking of the ball. The age of this last case was 31.

These four operations just mentioned as progressing abnormally were in the oldest of the entire number of persons upon whom laceration was performed, and in each case the needle was entered *through the cornea*. My experience, though comparatively limited, teaches me two things in regard to this operation, viz.: that it is safest in children before reaching puberty, the danger increasing year by year from this time on. Also, that it is frequently unsafe to enter the needle *through the cornea*, but *scarcely ever through the sclerotic*, passing it between the lens and the iris. The reasons for all this are obvious. I have frequently made the operation through the sclerotic, and have never had the slightest trouble follow, and have invariably found it easier of performance, since in this position greater play can be given the needle. In my opinion, it is particularly applicable when a repetition of the operation is required, as is usually the case in soft cataract, where the lens has already been partially broken in pieces by the first operation.

The ages of the forty-nine (leaving out the four before mentioned, aged 15, 18, 27, and 31, and still another, aged 20) ranged from five to thirteen years, and the vision of each (again excluding the same four) was more or less increased, though in a few only very slightly, while in others prominently so, and, indeed, in some the restoration to normal vision was almost complete. Children with cataract should be operated upon very early in life, and the fact that they are not, oftentimes renders the operation very nearly useless, because of the atrophy of the optic nerve which necessarily follows its continuous non-use, brought about by a cataractous lens preventing the entrance of light into the interior of the eye, and the proper exercise of the nerve and retina. A single glance with the ophthalmoscope at the optic nerves of children who have had cataract, especially if congenital, will in many instances easily demonstrate the reason why an operation, perfectly successful in itself, is so often crowned by such negative results. I have in several instances been able to benefit the condition of the nerve, and thereby increase the vision, by the free and persistent use of strychnine, with, in some cases, the systematic use of electricity. This treatment is, at any rate,

worthy of trial in every instance where such a condition of things exists. One should be particularly guarded about giving a favorable prognosis in cases of congenital cataract, if such prognosis is based upon the fact that the little patient has good perception of light, can distinguish colors, etc.; for not unfrequently, after the complete absorption of the lens, the vision is but little if any better than before the operation.

In summing up the results I have for convenience sake, placed the cases under four different headings,¹ viz.:—

1. *Complete success*, with vision ranging from $\frac{1}{10}$ to $\frac{1}{1}$, with which patients can, with proper glasses, attend to most of the ordinary duties of life, and, in the most successful cases, read and write.

2. *Half success*, with vision ranging from $\frac{1}{20}$ to $\frac{1}{10}$, with which, even in the most unfavorable cases, the patient can go about alone, and, in the favorable, are able to do ordinary work and read very large type.

3. *Curable blindness*, in which a subsequent operation will in all probability restore more or less vision, inflammation having marred the good effects of the first.

4. *Incurable blindness*, in which nothing more can be done for the relief of the individual, the operation having proved to be a failure.

Taking first the 135 operations by extraction (including the one by the flap method), and afterwards those by laceration, we have, of the 135—

Complete success in . . .	109 cases—that is, 80.8 per cent.
Half success in . . .	10 “ “ 7.4 “
Curable blindness in . . .	2 “ “ 1.5 “
Incurable “ in . . .	9 “ “ 6.6 “
Complicated in . . .	4 “ “ 2.9 “
Death from apoplexy six hours after operation in . . .	1 case “ .7 “

It should be borne in mind that several of these cases in the above table, under the head of “complete success,” had progressed abnormally after the extraction, and required a second operation to bring them into this class and condition of completeness. The “complicated” cases, being cataract resulting from irido-cyclitis, *should not* be brought into the *general estimate of results*, but I add them here in order to make the list complete.

¹ According to Knapp's arrangement.

Some good was accomplished in each instance by the operation, but it was again lost by a revival of the irido-cyclitis in its acute form. The "death" in the one case, and the case of couching, are added here for want of a better place to locate them.

Of the 49 operations upon young persons and children (made by discision or laceration), we have, classing them in the same way as the extractions—

Complete success in	.	.	.	25	cases—that is,	51.	per cent.
Half success in	.	.	.	20	"	"	40.8 "
Curable blindness in	.	.	.	2	"	"	4. "
Incurable " in	.	.	.	2	"	"	4. "

Excluding the last four cases, all had more or less increased vision, but the twenty-five (under "complete success") had a remarkable increase of it, enabling them, in a few instances, to see sufficiently clearly to read or write, and the same good result might have been accomplished in some of the others under this heading had they been mentally able, or had proper practice in such exercises. Those who have had much experience in operating upon cataract in children, will at once appreciate the success gained in the above entire number of operations.

An iridectomy and the removal of the remaining portion of lens will soon be made upon the cases of "curable blindness," with every prospect of success. In regard to the effect of age upon the progress and success of the operations (extraction and laceration), I am inclined to the opinion that, as a rule, other things being equal, the old get well just as satisfactorily as those younger in years, and the only difference in the result is that which is attributable to the failure of vision naturally connected with the increase in number of years. The following table (including children and adults) will show the influence that age may have had in deciding the good or bad termination (that is, the vision) of the cases:—

AGE.	No. of Cases.	VISION.			REMARKS.
		Good.	Medium	Bad.	
Between 1 and 10 yrs.	14	2	12	}	All 30 were by laceration or discision. The vision of one of the "bad" ones can be increased by a second operation.
" 10 and 20 "	16	8	6		
" 20 and 30 "	20	19		1	Vision can be improved by a second operation in the "bad" one.
" 30 and 40 "	15	13		2	
" 40 and 50 "	20	14	2	4 ¹	The four "bad" ones are the "complicated cases" before mentioned: vision benefited but again lost: one of the "medium" is the traumatic cataract by explosion, in which vision subsequently diminished.
" 50 and 60 "	28	28			
" 60 and 70 "	29	22	4	3	
" 70 and 80 "	35	25	6	4	
" 80 and 90 "	8	5		3	One of the "bad" can be benefited by a second operation: one of the "good" was she who died from apoplexy.
	185	136	30	19—4=15.	

It will be seen that the number of cases in this table under "good vision" exceed those in the other tables under "complete success" by two. This is due to the fact that under the head of "good vision" I have placed the case which died a few hours after the operation, evidently from apoplexy. The operation was made without the least trouble, and everything was progressing quite smoothly up to the time of death. For this reason it is classed under this heading. I have also put here the case of couching. The very worst of those under "medium vision" can go about unattended, and the most of them are able to attend to the usual everyday duties of life.

Under "bad vision" are the four cases of cataract resulting from irido-cyclitis, each of which was, to some degree, improved by the extraction, but the amount of sight thus gained was subsequently lost by an acute attack of the original disease. Deducting these four from the general estimate of results, there still remain fifteen under "bad vision," four of which are "*curable*" by a large iridectomy being made, forming an artificial pupil. There are then only eleven absolute failures ("incurable blindness"), or 5.9 per cent. of the whole number, and three *partial* failures ("curable blindness"), the latter being still amen-

¹ Complicated cases which should not be placed in the general result.

able to treatment: in short, a success of 94.1 per cent. of the whole number.

The influence of age upon the success of the operations can be seen at a glance at the foregoing table, the *greatest percentage* being between the ages of 50 and 60.

The duration of the treatment in the different cases was quite variable, as can be seen from the following table.

They were dismissed from treatment as follows:—

6 after 6 days.		20 after 21 days.	
12	“ 7 “	7	“ 23 “
12	“ 8 “	13	“ 24 “
6	“ 9 “	2	“ 26 “
5	“ 10 “	9	“ 27 “
9	“ 15 “	3	“ 29 “
15	“ 16 “	17	“ 30 “
6	“ 17 “	3	“ 35 “
12	“ 18 “	2	“ 43 “
6	“ 19 “	5	“ 45 “
14	“ 20 “	—	—
		184	3608

making the *average* time under treatment, that is before their dismissal, about twenty days for each case.

The case of sudden death is left out of this table, inasmuch as no change of importance is produced thereby in making up the general average. The cases of discision are also here included, and it must be mentioned that upon most of them a second, and upon a few a third, operation was necessary, but the length of time that they were kept under treatment, after each, was about the same, and corresponds to the smallest numbers of days in the table.

Below is a table showing the amount of vision had by the different cases after the operation (*i. e.*, upon their dismissal), tested by means of double convex (cataract) glasses. They are arranged in groups, several having the same amount of vision.

5 had vision equal to	1	9 had vision equal to	$\frac{1}{10}$
18 “ “ “ “	$\frac{2}{3}$	5 “ “ “ “	$\frac{1}{12}$
25 “ “ “ “	$\frac{1}{2}$	7 “ “ “ “	$\frac{1}{15}$
16 “ “ “ “	$\frac{2}{5}$	3 “ “ “ “	$\frac{1}{20}$
14 “ “ “ “	$\frac{1}{3}$	6 “ “ “ “	$\frac{1}{40}$
9 “ “ “ “	$\frac{1}{4}$	4 “ “ “ “	$\frac{1}{50}$
12 “ “ “ “	$\frac{1}{5}$	1 “ “ “ “	$\frac{1}{75}$
13 “ “ “ “	$\frac{1}{7}$	2 “ “ “ “	$\frac{1}{100}$
15 “ “ “ “	$\frac{1}{8}$	1 “ “ “ “	$\frac{1}{200}$
		1 died from apoplexy.	

The remaining nineteen cases are made up of the "four complicated" (viz., cataract resulting from irido-cyclitis, which again appeared acutely after the operations, and destroyed what little vision was gained thereby—not to be classed in the *results*), the four (partial successes, or "curable blindness") which still require secondary operations to give them good vision, and the eleven resulting in complete failure, making, with those enumerated in the above table, the entire number (185) of cases.

In operating upon these cases, no regard whatever has been paid to the season of the year in which they presented themselves, so that, indeed, every season and every month have been thoroughly tested, so to speak, and as yet I have found no reason for preferring one season or one month to another, with the view of affording a more favorable progress or a better termination of the cases. The heat of summer makes the necessary confinement of about a week to the bed and room quite uncomfortable to the patient, but it does not exert the least influence upon the ultimate result of the case. In short, so far as the success of the operation itself is concerned, no particular time or month seems to possess any special advantage over another.

In conclusion, I merely wish to call attention to the well-known advantage of quinine in surgical operations. It is not necessary for me to speak of its action, but there is no doubt of its beneficial effects in cataract operations.

ON CATARACT EXTRACTION.

By H. KNAPP, M.D.,

NEW YORK.

I HAVE compiled from the annual reports of the Ophthalmic Institutes of Heidelberg and New York, which have been under my charge, the statistics of all the cases of extraction that I have made from the year 1862 to the present day. They give a sum total of 916 extractions: 553 were performed in Heidelberg, during eight years; 363 in New York, during ten years and a half.

At once the striking fact shows itself that the number of cataract operations was relatively much greater in Heidelberg than in New York, for the number of eye-patients that came under my care in Heidelberg was a great deal smaller—not much more than half the number of those in New York. I do not presume to explain this discrepancy, as the reason of it may be personal, at least in part, though the same scarcity of cataracts has been noted in the majority of American ophthalmic hospitals as compared with European institutions.

Flap Extraction.

In the first years of my practice I extracted all hard cataracts by the *flap section*, which I performed, on the whole, 140 times.

The results were as follows:—

Good, 116, = 82.9 per cent.

Moderate, 5, = 3.6 per cent.

Failure, 19, = 13.5 per cent.

During the first years I practised the old, classical method, with a Beer's knife. The globe was steadied with the toothed fixing forceps, which are still in general use; the capsule was divided in the centre by a crucial laceration with a Graefe's cystitome, and no iridectomy was performed. All kinds of reaction followed this procedure. About one-tenth of the eyes were lost by suppuration, either primary or secondary, of the cornea. Another very unpleasant consequence was prolapse of the iris, which

frequently necessitated the removal of the protruding part, either some hours or some days after the operation. Thirdly, there were the frequent iritic processes, leading to more or less complete obstruction of the pupil, requiring after operations, *e. g.*, iridectomy, iridotomy, division of pseudo-membranes by one or two needles. I had no reason to be more satisfied with my success in the classical flap extraction than the majority of operators had with theirs, and therefore tried the different modifications which at that time were proposed and gained temporary favor, in particular, *Jacobson's large peripheral flap section*, *Mooren's preliminary iridectomy*, and *V. Graefe's flap section combined with simultaneous iridectomy*. No one of these modifications had such advantages over the classical flap as to insure its adoption as a general method. Then followed—

Von Graefe's Combined Peripheric Linear Extraction,

with which I became acquainted not only through reading, but in the institution of Von Graefe himself. The merits of this method have always appeared to me so great, that up to this day it has remained with me the general method. Only twice, during thirteen years, have I temporarily abandoned it, to try A. Weber's method—incision with a large curved lance-shaped knife—and Pagenstecher's method of removing the lens within the unbroken capsule. The results which Graefe's operation gave me, in the first three hundred cases, were very favorable; later, they were somewhat less so, yet, on the whole, they were better than those obtained from the regular flap operation.

I have made the regular Graefe's operation over six hundred times. Including the other methods mentioned before, which all were combined with iridectomy, the number of *modified extractions* which I have performed sums up to 735. The results were—

Good, 635, = 86.6 per cent.

Moderate, 54, = 7.3 per cent.

Failure, 46, = 6.1 per cent.

These results are, on the whole, satisfactory, and harmonize well with those of such operators as have published extensive statistics. I have, therefore, no reason to abandon Von Graefe's method.

With regard to the *execution of the operation*, I may mention that I now make the section less peripherically than at first, preserving, however, the linear principle. This necessitates the

excision of a large piece of iris, lest incarceration of that membrane ensue at the corners of the wound. As to the division of the capsule, I have abandoned the central crucial or multiple laceration which I practised at first, as well as the excision of a square-shaped piece of the anterior capsule, which I practised about eight years. For almost two years I have divided the capsule only at the periphery, either by a large horizontal division along the corneal section and a short vertical division joining it in the centre, or by a long horizontal division alone. I was prompted to resort to the peripheric division of the capsule by the many reactive processes that followed the central division and excision.¹ As far as my experience goes, these reactive processes are greatly diminished by the peripheric opening. The capsular bag commonly closes in the first night after the operation, shutting up all remnants of cataract. The anterior chamber and iris are, therefore, uninfluenced by remnants of lens and shreds of capsule. The recovery is commonly very smooth, and distinguishes itself by the exceedingly rare occurrence of iritic and capsular processes. Up to the present day, I have divided the capsule according to this method in seventy cases, the visual results of which have been as follows:—

S. $\frac{20}{20}$ in 7 cases.	S. $\frac{20}{200}$ in 1 case.
S. $\frac{20}{30}$ in 10 “	S. $\frac{7}{200}$ in 1 “
S. $\frac{20}{40}$ in 11 “	S. $\frac{5}{200}$ in 1 “
S. $\frac{20}{50}$ in 10 “	S. $\frac{3}{200}$ in 1 “
S. $\frac{20}{70}$ in 16 “	S. 0 in 4 “
S. $\frac{20}{100}$ in 8 “	

Good results in 63 cases=90 per cent.

Moderate “ 3 “ =4.3 per cent.

Failure “ 4 “ =5.7 per cent.

These results, gentlemen, are mostly final; in a certain number only they are primary, requiring an after-operation, *i. e.* the subsequent division of the centre of the capsule, which in the great majority of the cases seems to be necessary, and always has been successful.

About the technique of the primary and the secondary divisions of the capsule, gentlemen, I beg leave to show the instruments which I think most appropriate, and to give some illustrations on the blackboard, referring for fuller information to a paper on a *sixth hundred of Graefe's cataract extractions*, which

¹ I have learned, subsequently, that M. Gayet, of Lyons, has practised the peripheric division of the capsule as a method since 1873.

I am preparing for the *Archives of Ophthalmology*,¹ and in which the subject will be treated in detail. Allow me, however, here to state, that in peripheric division of the capsule it is most important to cut, and not to tear, the capsule. The instrument must have a very sharp edge. If the capsule is torn open in the shape of an angular rent, vitreous is apt to escape, which, in this operation, I have found to be a very untoward accident. The secondary capsulotomy is best done in a **L**-shaped manner, with a sharp, moderately broad needle. Future experience will show whether the mode of dividing the capsule just described has sufficiently great advantages over the other methods to warrant its general adoption. Thus far it has rendered, in my hands, the extraction a safer operation than before, but in the great majority of cases an after-operation was necessary, which may be performed as early as three weeks after the extraction and at any later period.

Linear Extraction.

Besides the extraction by the regular flap and the peripheric linear section, I have made 41 linear extractions—37 in Heidelberg, 4 in New York. The results were as follows:—

Good, 38, = 92.7 per cent.

Moderate, 0, = 0 per cent.

Failure, 3, = 7.3 per cent.

I practised this operation exclusively in soft cataracts of young people, *i. e.* between the ages of fifteen and thirty-five years. Though the results are not bad, I have almost completely given up this method; the healing being frequently disturbed, and adhesions between iris and cornea, or capsule and cornea, not infrequent, even when iridectomy was performed. The suction method, according to which I have made a few operations, showed the same drawbacks. In the majority of cases of soft cataract I now resort to the slower, but safer and more satisfactory process of absorption.

In conclusion, gentlemen, let me say that these statistics, drawn from the annual reports, and forming the basis of these remarks, might be slightly modified if I compiled them directly from my case books. The results could not, however, be essentially different.

¹ Appeared in the July number of the eighth volume, 1879.

ON DISEASE OF THE MASTOID PROCESS.

By H. KNAPP, M.D.,

NEW YORK.

IN proposing to make some remarks on the inflammatory diseases of the mastoid process, in particular on the so-called mastoid abscess, I ask you not to expect new or original statements. I merely purpose to communicate some of the impressions which I have received from the observation and treatment of no small number of cases that have come under my care.

The importance of mastoid disease has not been underrated by the profession. All the text-books treat of it more or less extensively, and many instructive and exhaustive—if medical treatises can be called exhaustive at all—monographs on the subject have lately appeared, among which I may particularly mention those of Dr. A. H. Buck, of New York, in the *Archives of Ophthalmology and Otology* (III. 1, p. 172, etc.), of Dr. Bezold, of Munich, in the 13th volume of the *Archiv für Ohrenheilkunde*, and above all, the series of articles published by Prof. Schwartze, of Halle, in the *Archiv für Ohrenheilkunde*, from 1872 to 1879, the last having appeared a few weeks ago. Schwartze's papers contain the history of fifty cases of opening the mastoid, with critical remarks, an introduction on the anatomy of the mastoid process, and in conclusion a summary of the cases with general remarks.

Mastoid disease may be considered as primary (idiopathic) and secondary (propagated), and as external and internal; the classification, therefore, would be:—

- a. *External primary, and external secondary;*
- b. *Internal primary, and internal secondary inflammations.*

External primary inflammation of the mastoid process is a rare disease. It was, to my knowledge, first described by Voltolini, of Breslau. I have seen only a few examples of it, the most

marked of which was reported at the first International Otological Congress, and published in the Transactions of that society. The affection is characterized by absence of disease within the external meatus and middle ear, considerable pain behind the ear and in the head, fever, tenderness on pressure, redness and puffiness in the mastoid region, extending over the upper third of the sterno-mastoid muscle, but not along the jugular vein. In a week or two there is fluctuation, and an incision down to the bone liberates a moderate quantity of pus. If no incision is made, the symptoms continue to aggravate, the pus burrows underneath the periosteum toward the occiput and along the sterno-mastoid muscle down the neck into the mediastinum, being the cause of death in one of Voltolini's cases. The disease has a great tendency to affect the other ear in the course of some months. We may call it *periostitis suppurativa externa processus mastoidei idiopathica*. The treatment, if ice, rest, and aperients do not check it in its initial stage, is a deep and extensive incision.

The *secondary external inflammations* of the mastoid process are propagated thither from the external auditory canal. Of this variety I have seen a goodly number, brought about by sea-bathing and other causes. There is swelling of the wall of the meatus, especially of its outer and middle portions, which, in acute cases, after a week's duration or longer, leads to swelling of the skin immediately behind the auricle and of the auricle itself, filling up the auriculo-mastoid furrow or sinus. Very intense pain and, not unfrequently, cerebral symptoms accompany this affection, but the preservation of good hearing, the diminution of the swelling in the innermost part of the canal, and the unimportant changes of the drum-membrane, the absence of râles on inflation, as well as the absence of rhino-pharyngitis, show that the middle ear is not, or is only slightly implicated (by extension), and that the cerebral symptoms are of a reflex character, having no inflammatory meningeal origin. These cases are extensions of perichondritis and periostitis of the meatus to the periosteum of the mastoid process. Their treatment is the same: deep incision near the auricle, and, when the primary disease of the walls of the meatus is marked, deep incisions within the meatus also are indicated. As soon as, in deep-seated otitis externa, puffiness and tenderness of the auricle and post-aural region supervene, the affection of the

periosteum and its extension behind the ear are either present or imminent, and an extensive incision of the wall of the ear-canal down to the bone should not be delayed. Moist heat applied only to the inflamed part, cleanliness and keeping the opening free as long as pus is secreted, will commonly lead these cases to a rapid and favorable termination. External mastoid inflammation is more frequently propagated from disease of the middle ear and the interior of the mastoid process, than it is primary or propagated from the external ear-canal without implication of the middle ear. To this variety I shall recur later on.

Internal primary inflammation of the mastoid process has never been brought to my notice, but the *secondary inflammation* has come under my care in all its varieties as far as they are known. The great majority of them originated in acute or chronic suppuration of the middle ear, combined with or resulting from rhino-pharyngitis. In some, however, the disease originated in the external meatus, and then mostly, as far as my memory serves me, was caused by sea-bathing.

I may mention, as an example, the case of a strong man, who never had had any ear trouble until sea-bathing brought about a faint, diffuse redness of the inner portion of the meatus and of the drum membrane, besides a furuncle in the middle portion. He recovered in two weeks and went to the country. There a relapse took place; he returned, and I found circumscribed swellings both on the anterior and the posterior wall of the meatus. The hearing was good when the auricle was drawn backward. There was no pharyngitis. I advised him to fill his ear with warm water several times a day, and poultice the walls of the meatus by a flaxseed cataplasm put in fine linen in the shape of a cornucopia. The pain increased, the furuncles pointed and broke, but a few days later there was more copious purulent discharge, and both by inspection and the whistling sound on inflation the drumhead proved ruptured. I ordered rest and careful syringing of the ear. No astringents and no method of inflation employed. The naso-pharynx was healthy. The pain increased, headache and fever supervened, and the mastoid region grew red and puffy. As on the next day all these symptoms were more marked, I made a deep incision into the moderately swollen skin of the mastoid process, and, feeling by the second stroke with the scalpel that the region in the slight depression at the level of the upper wall of the meatus was less hard than the remainder of the bone, I cut into it with force, until I had pierced the outer table of the bone,

whereupon a small quantity of serous pus was evacuated. I enlarged the opening with a strong probe, and put lint over the wound. The day after, more and thicker pus was evacuated. I enlarged the opening still more, kept it patent at first by the introduction of lint, then of a permanent silver drainage-tube, which I removed and cleansed twice daily. The disease being acute and the pus of good quality, I, for some weeks, abstained from syringing the mastoid cavity, but later had to do it, and repeatedly had to remove granulations with a moderately sharp, hollow spoon (Schufler-Waldau's spoon for cataract extraction). The drum-head and meatus healed in a few weeks, but it took many more weeks before the suppuration in the mastoid cavity ceased and recovery took place.

Much more frequent are the cases in which the suppuration occurs primarily in the middle ear, and sooner or later is extended to the mastoid cells. The implication of the mastoid may in acute cases soon become so prominent as to require the opening of the process. Eleven cases of this kind were reported by Schwartze, two by Dr. Grüning, of New York, and others by other observers. This operation is always indicated, when the otorrhœa suddenly stops or diminishes, while the inflammatory symptoms in the mastoid region and the cerebral symptoms persist or grow worse. But also when the discharge through the meatus continues unabated the persistence of the cerebral symptoms may not only justify, but demand, the opening of the mastoid.

Quite recently a case came under my care where, after an exposure, acute primary otitis media occurred in a healthy man. When, after three weeks' duration, the otorrhœa continued copious, and the violent and persistent pain over the whole corresponding side of the head, greatly increased at night, did not diminish, I made a large Wilde's incision, and drilled a hole into the mastoid process at the slight depression behind the upper wall of the meatus. A considerable quantity of matter escaped. The headache disappeared from that moment, and the patient recovered rapidly.

Though the cerebral symptoms had by no means been threatening—there was neither nausea, nor vomiting, nor delirium—I thought that the continuance of the headache after the otorrhœa had set in, and the puffiness, redness, and tenderness of the mastoid region, were sufficient indications of suppuration within the mastoid process, and of an insufficient outlet of the pus. The operation proved the supposition to be true.

*Chronic secondary mastoid disease is frequent and varied:—*cattarrhal and suppurative inflammation, formation of granulation tissue, collections of cheesy and pearly material, caries and necrosis. For brevity's sake I shall discuss this variety according as prominent symptoms furnish special indications for treatment.

In many cases the inflammatory products are retained in the mastoid, and the irritation is extended to the brain, by *granulations filling the drum-cavity* after more or less extensive destruction of the membrana tympani. Thorough cleansing and inspection of the drum-cavity should be our first step in taking charge of any case of chronic perforative inflammation. The removal of polypoid excrescences is self-evident. But even when this has been done, the otorrhœa and severe cerebral symptoms may continue. I have seen cases where excruciating headache, nausea, occasional vomiting, and delirium at night existed for weeks, yet the mastoid region was neither swollen nor red, nor sensitive to the touch, but the inner and lateral walls of the drum-cavity were lined with a thickened mucous membrane, which showed no polypoid masses, nor a particular protrusion of the inner upper wall of the meatus. The probe, in such cases, detects the fleshy character of the proliferating mucous membrane. I have found it best in such cases to scrape all the fleshy masses out, according to Oscar Wolf, and have seen severe cases rapidly recover under this treatment. The spoon which I employ for that purpose and find very excellent, and which also Bezold uses, is Schuft-Waldau's cataract spoon. It not only removes all granulation tissue, but also carious portions from the walls of the drum.

Another symptom suggestive of retention of morbid material within the mastoid cells is a *spherical protrusion of the upper-inner end of the meatus*, as first pointed out by Toynbee and Duplay. This swelling should always be incised with a slightly bent scalpel or a sharp hook-like instrument. The posterior wall of the meatus and drum-cavity, especially the upper part of the latter, should then be explored with a grooved flexible blunt hook, in order to ascertain the nature of the contents of the mastoid antrum, as well as the surface of the bone. In this way I have liberated pus, scaly masses, and cheesy material. The opening and exploration may be advantageously followed by directing a stream of warm water cautiously to the diseased

part. If the hook brings out particles of cheesy material, and syringing is of insufficient immediate effect, a warm half per cent. solution of bicarbonate of soda may be instilled several times daily, and the syringing repeated according to circumstances. I have seen that syringing in this way brought out incredible quantities of decomposed or dried-up substances which were retained in the antrum and cells of the mastoid, just as persistent and gentle syringing will bring out the accumulations in the meatus and middle ear.

Sequestra of the meatus, the drum-cavity, and the mastoid process, if projecting into the drum or meatus, are best removed by means of the grooved hollow flexible hook, which I have used and recommended for the extraction of foreign bodies from within the eyeball.¹

The propagation of tympanic disease to the mastoid process is, so far as my experience goes, always accompanied by tenderness to the touch, redness and swelling of the mastoid region. When these symptoms were absent, and the mastoid process was opened for the relief of severe cerebral symptoms, I have always seen the operation fail to evacuate pus or any other morbid substance. As I have repeatedly witnessed such operations, I have been on my guard and warned my pupils against the indiscriminate opening of the mastoid process. Though I have never considered this operation as formidable in any degree, yet I cannot shut my eyes to its possible dangerous consequences from erysipelas and thrombosis, consequences which I have observed sufficiently to be impressed with the importance of this operation to which I resort only when unmistakable indications are present. I have spoken of these indications in acute cases. In chronic cases they are the symptoms above mentioned combined with cerebral symptoms—of which persistent pain over the corresponding half of the head is in itself sufficient—or persistent, offensive otorrhœa which does not yield to treatment of the middle ear.

There is, in addition, one symptom which we very frequently find, *fluctuating swelling behind the ear*, the so-called *post-aural abscess*. It presents itself in two varieties, which are different in their aspect as well as in their origin, as Bezold has lately pointed out. The one is a diffuse swelling of the posterior face of the auricle and the adjacent skin of the mastoid process. The

¹ Archives of Ophthalmology and Otology, pp. 311, vol. vii.

auriculo-mastoid sinus is filled up, and the auricle pushed forward as if a wedge had been driven in between it and the mastoid process. This variety is due to the periostitic and carious processes in the bony portion of the meatus, the posterior wall of the drum cavity, and the adjacent mastoid cells and antrum. The matter creeps up under the periosteum or through the tympano-petrosal fissure. The opening in these cases should be made close to the insertion of the auricle, the condition of the bone explored with a probe, carious parts cleansed, and necrosed parts removed with chisels.

In the other variety the swelling is more pronounced half an inch behind the auricle, but may extend considerably above and even in front of the ear. The auricle is not, or only slightly pushed forward, and the wedge-shaped filling of the auriculo-mastoid sinus is either absent or little pronounced. This variety results from the perforation of a true intra-mastoid abscess, and as far as my experience goes, the perforation mostly takes place in the shallow depression of the bone situated about half an inch behind and at the level of the upper wall of the external auditory meatus, or very slightly higher. It is also in this place that this variety of post-aural abscess should be opened by a deep, yet cautious incision. The surface of the bone should be explored with a probe, and I do not remember one case in which I failed to detect the communication with the mastoid cavity. If this communication be insufficient, it can readily be enlarged with a strong probe or a gouge, and the cavity of the mastoid explored. Probing of the mastoid cavity should be done in every chronic case of mastoid abscess, in order to remove morbid necrotic portions of the bony wall of the process or its cells, granulation tissue, cheesy and scaly masses (cholesteatoma), and the like. When, after the surgical or spontaneous opening of the abscess, fistulous passages remain for a long time, they are commonly due to caries and necrosis in some part of the process. The fistulous opening should be enlarged, the sequestra removed, and the disease treated according to the strict rules of surgical cleanliness, or, to use the modern expression, according to the strict rules of antiseptic surgery.

With regard to the instruments used in opening the mastoid process, I have commonly employed strong scalpels, chisel and mallet, or a hand-gouge and chisel, instruments always at hand and easy and comparatively safe of application; but Dr. Buck's

drill, surrounded with a safety canula, has likewise rendered me good service without ever having caused unpleasant accidents. I could, therefore, not so decidedly disapprove of its use as Schwartze does.

Gentlemen, I have gone over an extensive piece of ground, here and there in a hurried and dogmatic manner, for which I beg your pardon, but my remarks were limited by your time, if not by your patience. One thing, however, I may state: I have not made one assertion that was not borne out by personal experience. My inferences may have been erroneous, but your, and perhaps my own, further experience will correct the errors. Had time permitted, I would have preferred to treat of this subject statistically, furnishing the histories of cases as evidence of my statements.

OPERATIONS FOR CATARACT AND FOR MASTOID DISEASE.

By A. BLITZ, M.D.,
NASHVILLE, TENN.

CATARACT.

CASE of Mrs. E. M. T——, aged 71 years. Cataract in both eyes. Had been blind in right eye eighteen years, in left eye four years. Patient insisted upon having the right eye operated on, although of course I preferred to operate on the left, in which the cataract was more recent, and afforded a better chance of success. As she would not consent to this, I performed the operation on the right eye, at her residence, on September 23, 1877.

The patient was placed in the recumbent position, and, declining the anæsthetic, I at once secured the lids with the spring speculum, and standing behind the patient, I applied the fixation forceps, and made the corneal section (as usual for linear extraction), with a Graefe's knife, completing the section very nicely, and without touching the iris.

I then took up the iris-forceps and scissors, to make the iridectomy, but before I could touch the eye, the patient unfortunately strained slightly, and I saw the lens (in its capsule) escape through the wound, which was immediately followed by a small quantity of the vitreous humor.

As quickly as possible, I removed the fixation forceps and speculum and closed the lids, to prevent a further escape of vitreous. Without opening the lids again, I applied the bandage.

Two days after this I commenced the use of atropine drops, twice a day, reapplying the bandage after each instillation, which was kept up until the ninth day, when I removed the bandage entirely, but finding the ocular conjunctiva irritated, I used hot water dressings, besides the atropine drops. The conjunctival irritation soon subsided. The wound had healed very nicely.

The appearance of the pupil was peculiar. It was enlarged

above by the disappearance of the whole upper portion of the iris, which was hidden behind the sclerotic. The lower portion of the iris was slightly drawn upwards, and laterally seemed fastened to each terminal point of the sclero-corneal wound, thus making the pupil somewhat elliptical in shape.

When examined by oblique illumination, the iris at these points was found not to have been drawn into the wound and fastened in it, but appeared to be glued there by lymph. The patient, from the first time she was allowed to use the eye, complained that every object had a whitish appearance, which, after a short time, changed to a bluish tint. An ophthalmoscopic examination made about five weeks after the operation showed the optic disk considerably bleached, which may account for this peculiar bluish appearance of objects to the patient. The globe had apparently not lost in size, but tension was slightly less than normal. Vision with S. + $4\frac{1}{4}$ was $\frac{2}{80}$.

In answer to the remarks of Dr. Voorhies, I would say that I never attempt to make cataract extractions at the office, and let patients walk or ride home afterwards, at the risk of loss of eyes. I would not risk it with white patients, much less with colored ones, who, in regard to cleanliness, peculiar mode of living, scrofulous diathesis, etc., are worse subjects, and more liable to bad results. I would not risk it.

In regard to the mode of opening the capsule in cataract extractions, I suggest the making of one vertical cut through the capsule, of sufficient length to allow the free escape of the lens, without rupturing the capsule at its upper portion; this incision to be made about one and a half lines from the centre. The edge of the lens, by slight pressure, would present at the opening, and, rotating upon itself, would escape from the capsule, and then through the sclero-corneal wound.

MASTOID DISEASE.

Case of Mr. A. H. Lusk, aged 26, a young lawyer of N——. The patient stated that, on the morning of January 23, 1875, he awoke with sore-throat and disordered stomach. His physician, being called, prescribed for the disorder. At about 2 o'clock the same day, the patient experienced considerable pain in the left ear, corresponding side of face, and along the sterno-cleido-mastoid muscle, which, however, lasted only a short time. The

pain came and went, at intervals of about half an hour, until 6 P. M., when the entire left side of the head, face, and neck began to ache, and the pain in the ear increased so as to be almost intolerable. His physician injected morphia hypodermically over the mastoid process, affording great relief. Patient slept well until 12 o'clock, when the returning pain awoke him. Next morning the pain was intense.

The treatment consisted of morphia hypodermically whenever the pain returned, syringing of the ear, hot poultices over the ear and mastoid region, and sometimes leeches over the mastoid.

On the morning of January 26th, the patient discovered a soreness over the mastoid process. The pain in the ear had greatly diminished, but there was entire loss of hearing in that ear. Patient was then able to leave his bed. On February 20th he discovered a discharge of pus and blood from that ear, which, however, soon ceased, but reappeared on February 23d, continuing to flow without interruption.

I saw the case for the first time on March 6, 1875, through the kindness of the attending physician. After syringing, found meatus externus considerably inflamed and swollen. The introduction of the speculum was painful. I could only see a small portion of the tympanic membrane, which appeared very much discolored, and had a perforation at its posterior inferior aspect. I was unable to judge of the extent of the perforation, on account of the swollen condition of the meatus. The Eustachian tube was pervious. The region over the mastoid was not swollen nor discolored, but exhibited tenderness upon pressure.

My diagnosis was, "suppurative inflammation of the mastoid cells." I told the patient of his condition, and advised trephining of the mastoid.

After a week's delay, patient consented to the operation, which I performed on the morning of March 17, 1875, in the presence of Drs. Paul F. Eve, Duncan Eve, Buist, and others. The patient was placed in the recumbent position, and ether administered.

As soon as complete anæsthesia was produced, I made a semi-circular incision over the mastoid, dissected up the flap, and denuded the bone of its periosteum sufficiently to inspect its external surface. This did not show any sign of disease. I now proceeded to perforate the bone, using a burr-headed bone-drill, one-fourth of an inch in diameter. The point selected was

about three-fourths of an inch above the lowest point of the process. I drilled down carefully, until the opening was one-fourth of an inch deep, when I pierced the remaining thin wall with a pointed probe, and the pus escaped through the opening. I then enlarged the opening, and removed small pieces of necrosed bone, after which I syringed the opening with a warm carbolic acid solution. During the syringing of the opening, some of the fluid came from the ear, nose, and mouth. I kept the wound open by inserting a nail-shaped plug of lead. The part was syringed twice a day.

The patient got out of bed on the third day after the operation, but felt rather weak, and I prescribed a tonic. As his general health improved, his appetite became better. The discharge from the ear ceased entirely in a few days after the operation.

On March 30th, just thirteen days after the operation, I removed the plug of lead, and let the opening close up. The opening in the membrana tympani soon closed, and the patient's hearing is now nearly as good as ever before the disease.

THE PERFECTED SPONGE-CARRIER.

By LOUIS ELBERG, A.M., M.D.,

NEW YORK.

At the meeting of the Association in 1863, I presented a number of instruments for medicating the larynx under sight. Previous to that time, the apparatus and technical procedures for carrying out such treatment had been very imperfect. Since then, others, as well as I, have modified and improved some of the instruments and methods; and I am now desirous of bringing to the notice of the Association a forceps which represents the last step in a long course of changes which the sponge-carrier, described and figured in the 14th volume of the Transactions, pp. 308-310, has undergone.

The requisites steadily kept in view are: 1. That the proper dimensions and bend of the instrument be combined with strength and rigidity; 2. That a piece of sponge, lint, or other material, of either small or large size, be readily attachable, and held with so firm a grasp as to prevent the possibility of losing it, and yet, when desired, be detached without the necessity of being touched. 3. That the instrument can be easily and thoroughly cleansed, and be not liable to get out of order.

The perfected sponge-carrier consists of two separate blades, embodying in this construction the idea of the obstetric forceps. The blades unite scissors-like by a slot-joint. There is a broad-based conical guiding pivot, perforated in the direction of the blades, in the fore-part of the handle of the right hand blade, fitting in a corresponding depression in the opposite handle; the latter has on its outer side a slit, and carries a sliding button which moves a bolt that can be made to enter the perforation in the pivot. By this means the blades can be firmly united, and, again, readily separated.

The end of each blade is well toothed for a distance of 2 cm.; for this length, the blades meet laterally, while from here to the

joint the right hand blade covers the left. About $5\frac{1}{2}$ cm. from their extremity, the blades are bent at about $1\frac{1}{4}$ right angle (accurately at 114°), the turn being rounded; at the further distance of $5\frac{1}{2}$ cm. the joint commences, which is a little more than 1 cm. in diameter; thence the blades run side by side for a length of 9 cm., when the handles commence, which are 8 or 9 cm. long: so that the instrument from the end of the handle to the bend measures nearly 25 cm. or about $9\frac{1}{2}$ inches.

To attach the sponge or wad, it is held in one hand, usually the left, and the forceps in the other. A little practice enables the operator to manage the bolt and separate the blades to any required extent and fasten them securely with one hand. After the application has been made, the bolt is withdrawn, when the blades separate, and one is taken in each hand; the wad and any mucus or purulent matter attached to the blades have either already fallen off or are detached by rubbing the blades against each other. Every part of the instrument admits of being thoroughly cleaned, and if necessary disinfected.

Usually one forceps suffices for all cases; but I have some which I use for children's larynxes only, and some with which I can reach lower down in adults; the former are 1 and 2 cm. shorter from the bend to the toothed extremity, the latter 1 and 2 cm. longer.

The same dimensions and bend answer for nasal and pharyngo-nasal medication as well as for laryngeal. I frequently use, however, a forceps with the bend immediately at the toothed extremity for the fauces, tonsils, etc.

The same instrument straightened or with different bend can probably be usefully employed in otological, gynæcological, and other practice.

REPORT ON THE PROGRESS OF OPHTHALMOLOGY AND OTOTOLOGY.

By H. KNAPP, M.D.,
NEW YORK.

IN presenting the report which, by the organization of this Society, devolves upon the chairman of each Section, I beg to state that I have tried to hold it within the smallest possible limits, reviewing only what struck me as being of paramount interest. I have been unable to make a report on Laryngology, being too little conversant with this branch of medicine.

I. REPORT ON OPHTHALMOLOGY.

While the anatomy of the eye did not receive any important contribution during the last years, valuable investigations were published by Leber, Knies, and others, on the *Currents of Liquids and the Nutrition of the Eye*. These authors found by experiment that a fluid-current exists in the eye, which, starting from the choroid and permeating the retina, advances through the vitreous towards the lens and anterior chamber, finding its main outlet in the sclerotic at the periphery of the anterior chamber, through the trabecular tissue which forms the so-called Fontana's spaces. By this current a part of the retina and the whole vitreous and crystalline bodies are nourished. Its disturbances cause diseases in these parts, which in the vitreous and lens are very conspicuous. Occlusion of Fontana's spaces must lead to increased accumulation of liquid within the globe and to increased ocular tension, *glaucoma*. And, indeed, the obliteration of Fontana's spaces has by Knies, Weber, and others, almost constantly been ascertained by the microscopic examination of glaucomatous eyes. The majority of oculists, however, consider this obliteration as a secondary, not a primary, manifestation of the glaucomatous process.

Instead of the old, in different countries unequal, and irra-

tional, though practically quite satisfactory *inch system* of spectacles, the *metric system* has been introduced and is rapidly replacing the other, though not without sound protest (Hasner). The unit of the metric system is a lens of one metre focal distance, and is called a dioptrie or dioptre, 1 D. It is nearly equivalent to No. 36 of the inch system. A lens of 2 D is twice as powerful as one of 1 D, and, therefore, equivalent to No. 18 of the old system, and so forth.

In determining the refractive condition of eyes, the *astigmatic action produced by oblique position of the auxiliary glasses* has been dwelt upon, and ophthalmoscopes with movable mirrors have been constructed by Cooper, Wadsworth, Loring, and others, in which, as in Helmholtz's and Jäger's ophthalmoscopes, the auxiliary lenses are more or less perpendicular to the visual line of the observer. These modifications introduce a good deal of inconvenience into the handling of the ophthalmoscope, which will be an obstacle to their general adoption; moreover, the inconveniences resulting from the astigmatic action of obliquely-placed glasses can, for practical purposes, be sufficiently obviated by a proper position of light, patient, and observer.

Investigations on *color-blindness* occupy a prominent part in the ophthalmological work of the last two years. Since Holmgren pointed out the danger from color-blind railway officials, sailors, and other persons, after having found by the examination of from two thousand to three thousand persons that defective color-perception is by no means a rare disease (from 2 to 5 per cent. of all men), many oculists (Stilling, Donders, Cohn, Magnus, Jeffries, etc.) have made extensive investigations on this subject and have confirmed Holmgren's assertions. These investigations have brought out the remarkable fact that color-blindness is but rarely found in women, 0.05 per cent. to 1 per cent. according to different observers. This fact was used by Magnus in support of the hypothesis of the linguist Geiger, that the faculty of perceiving colors, the "sense of color," has been gradually developed in the human race, and more so in the female than in the male.

The tests for color-blindness are different. Holmgren's method of sorting colored worsteds is the most common. Stilling uses colored letters composed of colored squares printed in squares of another color, which the color-blind usually confound with the former.

Holmgren adheres to the Young-Helmholtz theory of color-perception, admitting three principal colors: red, green, and violet; whereas Stilling adheres to the doctrine of Hering, admitting four principal colors: red, green, yellow, blue; red and green, and yellow and blue being antagonistic, and he states that a person who is red-blind must be green-blind also, the same with yellow and blue. He says color-blindness is of three kinds: red-green blind, yellow-blue blind, and totally color-blind. Color-blindness may be congenital and acquired; in the latter case it is the companion of amblyopia in atrophy of the optic nerves.

A remarkable fact was discovered by Prof. Leber, of Göttingen: persons suffering from tobacco and alcohol amblyopia do not recognize colors in the centre of their visual field, but at the periphery—colorscotoma.

The subject of the *retinal purple*, discovered in man by Boll, and studied by Kühne, has thus far been more a matter of curiosity than the basis for a greater insight into the manner of visual perceptions.

John Müller's supposition of the *semidecussation* of the optic nerve fibres in the chiasm is corroborated by more autopsies.

In *cerebroscopy* (Bouchut) the views have gradually cleared up, and sanguine expectations been limited. The diagnosis of congestion of the optic nerve and retina, so often made by neurologists, when cerebral symptoms seemed to point toward it, is looked at with suspicion.

Of *embolism* of the cerebral retinal artery and its branches more cases have been recorded.

Diseases of the *eyelids* and their treatment:—Removal of tumors, especially *vascular tumors*, by Desmarres' modified clamp has been more extensively practised.

The occurrence of *blepharitis ciliaris* from strain upon the eye through overwork, or work under unfavorable conditions, or optical defects in the eye, astigmatism, etc., has been studied by Roosa and others.

Successful cases of transplantation of flaps without pedicle, for the restoration of lost parts of the eyelids, are recorded by Wolf, Wadsworth, Aub, and others.

Conjunctival diseases: no addition; but I may mention that another of those rare cases of *amyloid degeneration* of the conjunctiva has recently been described by Drs. Prout and Bull.

The transplantation of *rabbit's conjunctiva* to cure symblepharon and xerophthalmia was successfully done by Wolf, Becker, and others.

Cornea: in interstitial keratitis the opinion of its origin in inherited syphilis is gaining ground.

The *antiseptic treatment* is recommended in corneal ulcers, the nature of which is sometimes parasitic: "Keratitis mycotica," Horner.

In the diseases of the *inner membranes* there is nothing particularly new to be mentioned. In the subject of *intra-ocular tumors*, time has substantially confirmed the opinion which was advanced ten years ago, and has brought an unexampled simplicity into this subject, formerly thought so very complicated and obscure. This opinion is: the intra-ocular tumors, with very rare exceptions (*e. g.* granuloma and cysts of the iris), are of two kinds, glioma and sarcoma; glioma affects the retina, and occurs in children only; sarcoma, either pigmented or unpigmented, affects the choroid, and occurs only exceptionally (five cases on record) in childhood. The diagnosis of these tumors, in their incipient stage, can be made with the ophthalmoscope, and life saved by the early extirpation of the eye. I removed an eye with glioma ten years ago; the patient is living, and free from any symptoms of relapse. I have made the same observation in a case of sarcoma of the choroid. There are other such observations on record. Further, in several cases of *sarcoma of the iris*, the tumor was radically removed, and not only life, but even the eye, with full sight preserved. Gentlemen, these cases teach one thing incontrovertibly; *malignant growths may have an innocent primary stage, in which they can be radically removed*. The *optic nerve* is not infrequently the seat of pseudoplasms, which have been found to be mostly myxo-fibromas, myxo-sarcomas, and endotheliomas. Though it is possible to remove these tumors, with the preservation of the blind eye, the operation, successful in a few cases, is apt to be followed by immediate sloughing of the cornea and panophthalmitis, or the globe, after retaining its shape for some years, may gradually shrink. Tumors of a bony or vascular nature, situated deeply in the orbit, have been removed, with preservation of a healthy eye.

The frequent inefficacy of iridectomy in chronic glaucoma has of late induced several oculists to try the operation of *sclerotomy*. This consists in thrusting a narrow-bladed knife through the

upper (or lower) part of the anterior chamber, as in a cataract operation. The sclerotic is cut in its anterior border, but a bridge in the centre is left. Since glaucoma has been cured by that operation, its advocates, Quaglino, Wecker, Mauthner, and others, assume that it is not the excision of the iris, but the cutting through the scleral tissue, at the region of Fontana's spaces, which cures glaucoma.

The *dreaded sympathetic ophthalmia* has been the subject of considerable study during the last year. Dr. Alt, of Toronto, on the strength of the presence of neuro-retinitis in some eyes which he examined under the microscope, revived the idea that the irritation in sympathetic ophthalmia is transmitted through the optic nerve, instead of, as is generally believed, through the ciliary nerves. Dr. Goldzieher has found inflammatory changes in the ciliary nerves of eyes which had caused sympathetic inflammation in their fellows. As to the treatment of sympathetic ophthalmia, the prophylactic removal of a useless eye, that threatens to affect the other by sympathy, is gaining ground among oculists; but another operation—proposed by Von Graefe—has, during the last year, been frequently performed by Schöller, Schweigger, Hirschberg, and others. It is called *neurotomy optico-ciliaris*, and is practised as follows: The tendon of the external rectus is detached from the sclerotic, and drawn aside; then, with a pair of curved scissors, all the tissues connected with the posterior half of the sclerotic are cut, including the optic and the ciliary nerves. While this is done, the eyeball is so turned on its vertical axis that the distal end of the severed optic nerve looks straight forward. When the eyeball is turned back in its original position, the sensibility of the cornea is tested, to ascertain whether all the ciliary nerves have been divided or not, and the tendon of the external rectus is stitched to the globe again. Good results are cited from this operation, which certainly is a praiseworthy example of conservative surgery, but it has yet to stand the test of time. Bearing in mind the well-known fact of the obstinate return of neuralgic affections, after temporary cures by neurotomy and neurectomy, we may ask whether the ciliary nerves, when divided, do not reunite, as other nerves do, and continue to be the channels of sympathetic irritation?

The unfortunate cases of total leucoma of the cornea, in otherwise healthy eyes, have again induced several operators—Gower,

Hippel, Schöler, Sellerbeck, and others—to make new trials with the once much cultivated, but, for thirty years, generally abandoned, methods of *keratoplasty*. A central piece of the cornea, from four to six mm. in diameter, is drilled out, and a corresponding piece of clear cornea of man or animal inserted. Mostly, those pieces are obliging enough to unite with the eye, but the first case in which they remained permanently transparent, and afforded useful sight longer than for a number of months, has yet to be recorded.

In *cataract operation*, Graefe's modified linear extraction maintains its ground with from 76 to 86 per cent. of good results, 6 to 12 per cent. of moderate results, and 6 to 12 per cent. of failures. Since closer observation of the reactive processes has long shown that a great many more or less serious inflammatory changes originate in the free laceration of the capsule and in the irritation from remnants of cataract and shreds of capsule left in contact with the iris or wedged between the lips of the corneal wound, methods of operating are sought which are intended to reduce these dangerous conditions to a minimum. Instead of lacerating the capsule freely, or exsecting a piece of it, some of the very best operators—for instance, Arlt, of Vienna, Schweigger, of Berlin—adhere to the old maxim practised in the classical flap operation, to rip the capsule open in the centre only, and let the escaping cataract enlarge the opening. Other eye-surgeons open the capsule at the periphery only, along the corneal section; and others again, as the discussions at our meeting yesterday have shown, open the capsule by one long vertical incision. All these attempts aim at wounding the capsule as little as is compatible with the expulsion of the lens.

The means of *diagnosis* of eye diseases seem to have received, during the last year, no material additions beyond those referring to ophthalmoscopy and the tests for color-blindness mentioned before. The study of the *pathology and pathological anatomy* of the eye is vigorously pursued, and has produced three large pictorial works which will remain ornaments of medical literature; the first is by H. Pagenstecher, of Wiesbaden, the second by O. Becker, of Heidelberg, and the third by Poncet, of Paris.

In conclusion I may mention that the large ophthalmological cyclopædia, edited by Graefe-Saemisch, is completing its seventh and last volume; and that the progress of ophthalmology is recorded in *thirteen special journals*, four in German, two in French,

two in English (one published in London, the other in New York), two in Italian, one in Spanish, and one in Portuguese.

II. REPORT ON OTOTOLOGY.

Though less extensive, the progress of otology was no less marked than that of ophthalmology during the last year. The brilliant discoveries in acoustics, which surround the heads of some Americans with the laurel of immortality, are too well known to every body, and forbid me to occupy the closing hours of this meeting with their exposition. Though the microphone, megaphone, and phonograph have not, as yet, found practical applications in aural surgery, yet they open a field which, when further cultivated, will not lack its harvest. The investigations of Donders, Politzer, Scott, Blake, and others with the phonautograph have furnished us with beautiful tracings of sound waves written by the vibrating human membrana tympani with a delicate bristle attached to it on the blackened revolving paper of the graphic apparatus. O. Wolf, of Frankfort-on-the-Main, who has made such beautiful researches on the pitch and audibility of the vowels and consonants of the human voice, has examined with the microscope the tracings which the style of Edison's phonograph imprints upon the tinfoil, and finds that they show definite figures for each vowel and consonant sound, and calls them sound-figures. The vowel A (as in father) showed a figure like a shoe-sole, the O that of a dumb-bell, etc. Helmholtz, whose researches in acoustics have been, according to Tyndall, for the doctrine of sound and music what the researches of Newton have been to astronomy, subjected the telephone to mathematical analysis, and presented last fall to the Berlin Academy of Sciences a paper on this subject which is far beyond the ken of your humble servant. All this, gentlemen, shows that science has no nationality; the wave which started from the eastern shore of the Atlantic is received and fertilized on the western shore, from where it returns with the brightness and vigor of youth back to the old world.

In the pathology and treatment of ear diseases no striking discovery was registered during the past year, but a good deal of labor was fruitfully spent at imparting greater accuracy and efficiency to the diagnosis and treatment of the different affections of the ear. While certain operative procedures—the perforation of the membrana tympani, the excision

of a piece of that membrane, myringectomy, the introduction of an eyelet (Politzer) or a horseshoe-formed clamp (Votolini) in order to improve the hearing; further, the tenotomy of the tensor tympani muscle, and even of the stapedius, in order to relieve tinnitus aurium and improve hearing—are gradually being abandoned, two other operations have gained so much the favor of aurists that they may be said at present to be fully established in the legitimate practice of aural surgery: I speak of the paracentesis of the drum and the opening of the mastoid process. The rehabilitation of these two operations, the practice of which was once carried to excess, is more the work of Prof. Schwartz, of Halle, than of any other one man. The paracentesis of the drum, an easy and harmless little operation, may relieve patients suffering from acute inflammation of the middle ear of pain, and accomplish a great deal of good by evacuation of serous and purulent secretions from the tympanic cavity, thus perhaps limiting the destruction of the membrana tympani and shortening the duration of the disease if abstinence from operative interference would have led to spontaneous perforation of the drum-head. The operation is indicated when the membrana tympani is bulging and mucous râles are heard on inflation, or when inspection of the drum-head renders the presence of fluid substances in the tympanic cavity certain.

Of far greater importance is the opening of the mastoid process by means of drills or chisels in a number of severe affections of that part. When, in *acute* otitis media purulenta, the mastoid region is swollen, red, hot, tender to the touch, when the pain in the head does not disappear with the appearance of purulent discharge from the ear, or when the otorrhœa, fairly established, more or less suddenly ceases, but the pain in the ear, the headache, and perhaps other cerebral symptoms, increase, the mastoid process should be opened. When, in chronic otitis purulenta, the mastoid region remains inflamed, in spite of careful removal of all polypoid excrescences in the tympanum with the snare, forceps, and sharp spoon, the mastoid process should likewise be opened. When the posterior wall of the meatus near the drum is bulging, it should be deeply incised, and the mastoid antrum opened in this place. When sequestra are in this locality, the auricle should be detached from its posterior insertion, and the posterior wall of the osseous meatus chiselled away, in order to remove cheesy and scaly concretions and se-

questra of bone. Granulations in the mastoid process should be scooped out with a sharp spoon, the cavity cleaned by gentle syringing, and a drainage-tube, or lead style (Schwartz), or, better, a silver canula, with a flange to prevent it from slipping into the mastoid cavity, be inserted until the suppuration has ceased. All these operations have been extensively discussed and practised during the last years, and their indications and mode of execution have been more precisely specified than heretofore.

Another less important operation was performed once by Kessel, and twice by De Rossi. It consists in freeing the stapes from its connections with the chain of ossicles if they interfere with its vibrations. This was done by disarticulation of the anvil in the incudo-stapedial articulation. Before doing this operation, a hole has to be cut into the membrana tympani, if a hole be not already present.

Mr. President and gentlemen, I dare not enter more deeply into this subject lest I employ an inordinate part of your time. Permit me to state, that, in many subjects of otology upon which I have not even touched, the progress is quite manifest, and that in this department of medicine there is at the present day a considerable number of earnest and indefatigable investigators at work whose labors have explored a region of the human body which, in health as well as in disease, is surrounded with extraordinary difficulties. Last autumn one of the foremost members of these explorers, Politzer of Vienna, issued the first half of a text-book of otology, which is excellent in every respect.

Let me mention, in conclusion, that at present five special journals on aural surgery are published, three in German, and two in English, both the latter in New York.

MINUTES OF THE SECTION
ON
SURGERY AND ANATOMY.

MINUTES OF THE SECTION

ON

SURGERY AND ANATOMY.

TUESDAY, May 6, 1879.

THE Section was called to order at 3 o'clock P. M. by the President, MOSES GUNN, M.D., of Illinois.

The President appointed, as the sub-committee for the examination of the papers presented to the Section, Drs. BRIGGS, of Tennessee, DAWSON, of Ohio, and WESTMORELAND, of Georgia.

Dr. A. C. POST, of New York, read a paper *On Deformities of the Face and Hands, occasioned by Cicatricial Contraction following a Burn*. The case reported was well illustrated by photographs and plaster casts.

Dr. I. N. QUIMBY, of New Jersey, had seen the case before the operations had been performed, and testified to the remarkable success that had followed them.

Dr. W. T. BRIGGS, of Tennessee, thought the operations had been a great success, but feared, as the last operation on the case had only been performed a month ago, further contraction would again take place; as his experience had been that, in cases where great success seemed to have been attained soon after operation, in time the deformity became nearly as great as before.

Dr. POST thought that, if the contraction was once thoroughly overcome, it never returned.

Dr. A. M. POLLOCK, of Pennsylvania, thought that the transplantation of new tissue in this case would do much to prevent future deformity.

Dr. W. W. DAWSON, of Ohio, made some remarks on the kind of incisions made in these cases. His own results in such operations had been very unsatisfactory.

Dr. POST made further explanation of the details of the operation.

Dr. H. O. MARCY, of Massachusetts, read a paper on *Aspiration of the Knee-joint*. The reading of this paper requiring more than the allotted twenty minutes, on motion, Dr. MARCY was given an additional ten minutes in which to finish it.

Dr. W. A. BYRD, of Illinois, reported a successful case similar to those described in the paper.

Dr. POST reported a successful case in which modified aspiration was practised. The cavity, after the removal of the fluid, was injected with a solution of carbolic acid (1 part to 30), as practised by Mr. CALLANDER, of London.

Dr. DAWSON called attention to the use of the elastic bandage of Dr. MARTIN, in these cases, after aspiration; when this was used, there was no accumulation of the fluid.

Dr. MARCY stated that many cases had been reported in the German medical journals, in which the injection of carbolic acid after aspiration had been practised. He proposed to write a more extended paper at a future time, and asked the profession to report additional cases to him.

Dr. S. D. GROSS, of Pennsylvania, said that he had had some experience in the use of the aspirator in these cases, but thought aspiration only one means of treatment. Many cases require constitutional as well as local treatment, and in all cases the general condition of the patient should be considered. After the use of the aspirator, local applications of sol. plumbi acet. or hydrochlorate of ammonia are of great use, as is also the elastic bandage.

Dr. QUIMBY thought that, in cases of small serous accumulation in the knee-joint, aspiration should not be practised, as local means are sufficient to effect a cure.

Dr. E. B. TURNIPSEED, of South Carolina, read a paper with the following title: *New Surgical Needle; New Urethrotome or Hysterotome; A new Apparatus for treating Fracture of Clavicle, with Cases; A new Method of reducing Dislocation of the Elbow-joint, with Cases*. The instruments were shown, and their uses demonstrated.

Dr. GROSS said there was no operation in surgery more simple than the reduction of a case of recent dislocation of the elbow-joint.

Dr. J. H. WATERMAN, of Massachusetts, had taught the same method described in the paper, and therefore it was not new. In cases of some standing, the method of forced extension was much better.

Dr. ——— stated that Dr. GREEN, of Michigan, taught essentially the same method several years since.

Dr. J. C. HUGHES, of Iowa, said the apparatus for the treatment of fracture of the clavicle did not fulfil the indications for treatment better than those usually employed. Neither did he think the method of reducing dislocation of the elbow-joint advised any improvement upon any of those heretofore employed.

Dr. L. A. SAYRE, of New York, said he had never seen respiration interfered with in his plan of treating fractured clavicle by adhesive straps. He thought if the front strap of Dr. TURNIPSEED's apparatus was removed, it would be nearly as good as the old figure-of-eight bandage, but no better. The object to be accomplished in treating fracture of the clavicle is, to hold the ends of the bone in place; this had not been done satisfactorily until the introduction of his method of treatment by adhesive plaster. He explained how his dressing effected the desired end.

Dr. DAWSON said the subject of fracture of the clavicle was a very interesting one. He had used almost every form of dressing. There was one indication that Dr. SAYRE's dressing, as well as the others, did not fill, that is, to carry the shoulder outward. The vessels and nerves in the axilla will not tolerate enough pressure to perfectly accomplish this. Therefore deformities after this fracture exist. Dr. TURNIPSEED's apparatus tends to increase the very difficulty we wish to avoid. He considered Dr. SAYRE's method of treatment the best in use.

Dr. SAYRE said he recognized the defect in his dressing pointed out by Dr. DAWSON; but he did not advise the use of a pad in the axilla, for the reason that it was better to risk having a little deformity than to incur danger from the pressure of a pad.

Dr. POST very clearly described how the displacement of the ends of the bone, and the deformity, depend upon the point at which the bone was fractured. He did not think the apparatus offered any special advantage over some others employed. He generally prefers Dr. SAYRE's plan of treatment. The postural method offers some advantages, where it is desirable to avoid deformity, as in the case of young ladies.

Dr. GLENN, of Tennessee, said that Dr. EVE had advised treating fracture of the clavicle in young ladies by cutting down upon the ends of the bone, drilling holes in them, and uniting them together; that Dr. EVE had operated in this way with a perfect result.

Dr. BRIGGS thought that perhaps Dr. GLENN did not report Dr. EVE correctly ; his impression being, that he only so operated in a case of ununited fracture, where there was great deformity.

Dr. GLENN replied that he knew of one case, at least, in which Dr. EVE had performed this operation successfully on a recent case.

The Secretary reported that there had been placed upon his table by Dr. MOTTRAM, of Kansas, a paper with the title *Report of a Case of Chronic Dislocation of the Hip*.

On motion, Dr. MOTTRAM was permitted to read his paper.

Dr. DAWSON presented for inspection a case of handsomely prepared sections of various forms of urinary calculus removed by himself.

On motion, adjourned.

WEDNESDAY, May 7.

Section called to order at 3 o'clock P. M. by the President, Dr. GUNN.

Dr. I. N. QUIMBY, of New Jersey, read a paper describing *A Case of Conservative Surgery*, illustrated by drawings and photographs.

Dr. L. A. SAYRE read a paper bearing the title, *Proofs of the Superior Value of the Treatment of Spondylitis, or Pott's Disease, by Suspension, and the Retention in the improved Position by the Plaster-of-Paris Bandage*.

On motion of Dr. T. C. MADDUX, of Maryland, the thanks of the Section were tendered to Dr. SAYRE for his admirable paper.

Dr. POST made some remarks tending to show the importance of a correct application of the apparatus, in order to have success.

Dr. MARCY made a brief statement in relation to a case of spinal curvature treated by him, in which pregnancy did not interfere with wearing the plaster jacket.

Dr. L. A. DUGAS, of Georgia, made a verbal report concerning some cases treated by him, in which Dr. SAYRE's method was employed ; photographs of the cases were shown.

Drs. QUIMBY, of New Jersey, and BYRD, of Illinois, made some observations on the paper.

Dr. T. A. MCGRAW, of Michigan, inquired if the same success followed treatment in cases involving the lumbar vertebræ, as in those in which the disease was confined to the dorsal region.

Dr. SAYRE answered Yes, and appealed to his table of cases for proof of the correctness of the assertion. The application of the bandage, however, was more difficult. In answer to a question from Dr. DAWSON, Dr. SAYRE made various explanations in relation to his plan of treatment, and gave a history of two very interesting cases.

Dr. J. W. LINK, of Indiana, presented a synopsis of a paper on *Amputation by the Open-cone Shape Method*, illustrated by drawings.

Dr. BECK, of Iowa, held that the method was not new, and, therefore, the paper was not entitled to publication.

Dr. MARCY thought the paper of real value.

Dr. BYRD had operated successfully by this method.

Dr. QUIMBY thought there was real advantage in the method of dressing stumps described in the paper.

Dr. A. GARCELON, of Maine, thought there was much merit in the paper, an opinion coincided in by Drs. ORR, HUGHES, and FULLER.

Dr. LINK closed the discussion by stating that his chief claim to novelty was in the peculiar manner of dressing the stump, not in the operation, which did not differ greatly from the ordinary circular operation.

Dr. H. F. CAMPBELL, of Georgia, presented an abstract of a lengthy paper having for its title, *Urinary Calculus, considered in its Relations to Hygiene, Etiology, Pathology, and Treatment; with the Report of Forty-seven Cases*. With the paper was presented an interesting collection of various forms of urinary calculus from forty-six patients.

Drs. DAWSON and MUSSEY, of Ohio, and others, made some observations on the paper.

On motion, adjourned.

THURSDAY, May 8.

Section called to order at 3 o'clock P.M. by the President, Dr. GUNN.

The Secretary presented a paper from Dr. WILLIAM SCOTT, of Canada, entitled, *Ecraseur for the Removal of Uterine Tumors*, and moved its reference to the proper committee.

The paper was so referred.

Dr. J. R. WEIST, of Indiana, read a paper with the title, *Treatment of Hemorrhoidal Tumors by Carbolic Acid Injections*.

It was discussed by the following gentlemen, viz.: Drs. POST of New York, BYRD of Illinois, DAWSON of Ohio, QUIMBY of New Jersey, J. H. MURPHY of Minnesota, H. W. BROWN of Texas, E. SMITH of Michigan, and J. E. COOK of Georgia.

The Secretary called the attention of the Section to the action of the Association in referring to it for recommendation the question of dividing the Section, as moved by Dr. MADDUX, of Maryland. After some discussion Dr. MADDUX withdrew his resolution.

Dr. MADDUX, of Maryland, read a paper bearing the title, *Concerning the Nature of Blennorrhagia*.

On motion, the paper was referred to the sub-committee without discussion.

Dr. T. F. ROCHESTER, of New York, read a paper with the title, *Perityphlitic Abscess opening into Bladder and Rectum, with Pathological Specimen*. The paper was not discussed, owing to a lack of time.

Dr. A. M. POLLOCK, of Pennsylvania, read a paper describing *A New Instrument for the Administration of Anæsthetics*. The instrument was exhibited.

The regular order of business being exhausted, Dr. L. A. SAYRE made a demonstration of his method of treating spinal curvature, applying the plaster jacket to two cases.

On motion, adjourned.

J. R. WEIST,
Secretary.

ADDRESS IN SURGERY AND ANATOMY.

By MOSES GUNN, M.D.,

CHICAGO, ILLINOIS.

MR. PRESIDENT AND FELLOW-MEMBERS:—

WHILE, in the selection of the subject of my address, I have ignored the letter of the law which prescribes my duties, I trust that the spirit thereof has been so far complied with that my offence may meet with your generous pardon.

Medical history is replete with instances where brilliant conception has captivated the medical mind, and swayed, with irresistible force, medical literature and medical and surgical practice. The reigning idea receives universal homage, and co-ordinate principles are, for the time, largely forgotten.

A notable example of this powerful influence of the reigning idea over professional thought and habit is found in Lister's system of antiseptic surgery. Men who have followed him in his experiments and reasoning, and who are firm believers in his bacterian doctrine of causation; men who are convinced of the practical advantage to be derived from his method, without accepting all his reasons for that advantage; and men who are simply in the fashion, alike do homage to the man and his teaching, by following his practice. The success which attends the faithful employment of the Listerian method, and the potency of that method in diminishing, and even preventing, suppuration and septicæmia; the marked improvement in the condition of surgical wards, which follows its introduction into a hospital, have led many surgeons to regard suppuration as an unmitigated evil which should be promptly stamped out as we fain would stamp out epidemic infection. Whether the pendulum of professional sentiment has yet reached its extreme on the ascending portion of its arc, remains to be seen. Whether healing without suppuration is always to be desired; or, whether pus formation will sometimes serve a useful purpose in surgical

procedures, are questions that must eventually stand upon their own merits, uninfluenced by the fashion of the times.

It seems to the writer, however, an appropriate time to review the pathology of suppuration; to study its real nature, with reference to its dangers, and, if any it has, its salutary influences.

Perhaps the earliest clearly expressed and well-defined idea of the pathological nature of suppuration was that pus was formed by the liquefaction of fully-formed and perfected tissue, inflammation, acute or chronic, being the operating cause. In the absence of an accurate and minute knowledge of the physiology of nutrition, it was very natural that the phenomena which are to be observed in the natural history of an abscess should have led to such a conclusion. The inflammation with its phenomena; the softening of the parts, as suppuration takes place; the cavity which is left after the evacuation of the pus; and the real and apparent disappearance of tissue, were accounted for on the hypothesis that the tissue had, under the influence of inflammation, been transformed into pus, notwithstanding the phenomena attending superficial suppuration were clearly inharmonious with this explanation.

Effused blood and coagula were also supposed capable of transmutation into pus.

Hunter combated these views, and advocated the doctrine of secretion of pus; or, that pus was formed from the blood by a process analogous to secretion; and Hunterian doctrine became, by the weight of his authority, the professional creed.

The transition from this status of professional opinion to the conception that the vessels secreted a fluid which became pus, was easy and natural; as was, also, the further transition to the definite doctrine of exudation of blastema, reparative or constructive material, coagulable lymph, protoplasm, bioplasm, or whatever term fancy or judgment may apply to the exudate, and its subsequent change into pus.

This doctrine, which certainly is not inharmonious with the physiology of nutrition, held almost unchallenged recognition till Virchow announced that suppuration consisted in cell proliferation, the cell germs, or nuclei, being furnished by, or found in, the connective tissue. This doctrine, standing alone, uncomplicated by any other condition, and viewed under physiological light, was hardly a change in fundamental principle, for, as the cell nucleus possesses no *creative* power, but only the power to

appropriate and assimilate offered pabulum, and thus increase and multiply, it is to be looked upon only as a means or instrument of change by which offered blastema may be developed into tissue, or converted into pus; the antecedent state or condition of the material, pus, being, as in the exudation theory, blastema or constructive material which had been diverted from its natural use, viz., the building or perpetuation of tissue. But, unfortunately for this interpretation, Virchow makes another assertion which cannot be reconciled with his proliferation theory, and which, taken alone, disconnected from his proliferation hypothesis, carries us back to the earliest doctrine of suppuration. He says: "*Pus is not the dissolving, but the dissolved, i. e. transformed tissue.* A part becomes soft, and liquefies whilst suppurating, but it is not the pus which occasions the softening; on the contrary, it is the pus which is produced as the result of the proliferation of the tissue."

This brief quotation of only two consecutive sentences conflicts with itself, for pus cannot be a "dissolved tissue," and at the same time a "result of the proliferation of the tissue." A proliferation process is a budding, growing, branching process, not a dissolving process; and that such a process can result in a dissolution of the parent stock or tissue is, indeed, incomprehensible. That such a process might result in an early blight and falling off of the buds is very comprehensible, and might be received as an explanation of the *modus operandi* by which reparative or constructive material is, after having taken a step upward in development, by being appropriated and assimilated by the nuclei of the connective tissue, blighted, aborted, and thus, by such blight, abortion, death, converted into pus. Proliferation of the nuclei of the connective tissue, thus viewed, is philosophical, and quadrates with the physiology of nutrition. But that fully organized and perfected tissue can be transformed by a retrograde metamorphosis through all the mutations which constructive material passes in the ascending scale; or, that it can fall suddenly, by a single change, to the very elementary grade of organization which pus presents, is inconceivable, if we accept the current physiology of nutrition. Fully perfected and developed tissue can become pus only in one way, and that consists, not only in complete death and dissolution, but in being resolved into its original elements, thus going to the very bottom of the scale; and then, by being appropriated by a living

organism, and started again on the ascending scale of development, the *possibility* is opened of its being converted, through some accident or disease, into pus. But if, in dying, the tissue becomes "dust returned to dust," then it must pass through two living organisms before it can reach the *possibility* of attaining the grade of pus.

Virchow's views, however, were soon succeeded by the doctrines so earnestly advocated by Billroth, but which were first conceived by Cohnheim and which play a conspicuous role in his *General Pathology*. This doctrine pervades more extensively the pathological literature of the present time than any previous theory on this subject. The fact that, under certain circumstances, the colorless blood corpuscle forces its way through the vascular walls and is found in an extra-vascular position, infiltrating the tissues and accumulating in masses, together with the fact that there is a perfect similarity or rather identity in the physical form and appearance of the perfect pus-cell and the colorless blood-corpuscle, gives plausibility to the idea that pus is but an accumulated mass of wandering colorless blood-corpuscles. This doctrine is very justly accredited to Cohnheim from the fact that he demonstrated wandering leucocytes in the irritated cornea of a frog, and gave to the fact pathological significance. Billroth, also, strenuously claims this honor for him. He says: "Cohnheim made the following remarkable observation: he introduced finely powdered aniline blue into the lymph sac in the back of a frog, then irritated the animal's cornea with caustic, and found that numbers of wandering cells (lymph-pus-cells) containing aniline collected at the cauterized point; hence the conclusion, *at an irritated point white blood-corpuscles wander from the vessels into the tissue; these white blood-corpuscles constitute the inflammatory cellular infiltration.*" In acknowledging Waller's pre-discovery of white blood-cell migration, he adds: ". . . Cohnheim has the undivided honor of having correctly interpreted his" (Waller's) "observations on inflammation which have constantly advanced to the present time, and of having presented them in a form to greatly affect all modern pathology."

Billroth, as has already been stated, is an earnest advocate of this doctrine. He says: "If it now be established beyond doubt that most of the young cells which infiltrate the inflamed tissue and escape from it as pus, as we shall hereafter see, are white

blood-cells, or briefly, wandering cells, then two questions arise." Again: "Formerly it was not doubted that, whenever pus-cells appeared in groups, they were to be regarded as a production of connective tissue cells; according to our present views, there is no doubt that these young cells are escaped white blood-cells, and are simply grouped together from mechanical causes." Thus, he expresses his disbelief in the connective tissue proliferation theory, and fully endorses Cohnheim's wandering cell origin of pus. But further quotation will show that he also believes in the transmutation of tissue into pus, as evidenced by the following: "The tissue surrounding the spot first diseased is gradually infiltrated with cells; and it" (the tissue) "also goes on to form fluid cellular tissue with the character of pus; the infiltrated tissue is the more disposed to suppurate and break down when its vessels are little developed and do not supply sufficient qualitative and quantitative nutrient material to maintain the further development of the excessive cells. In abscess, a circumscribed cavity containing pus is thus formed; its walls are constantly being changed into pus." Thus we see that Billroth, although fully endorsing Cohnheim's escaped-cell origin of pus, also believes that fully organized tissue may be transmuted into pus. It is not probable that there are two methods of making pus.

There are several objections which may be urged against Cohnheim's doctrine. Individuals whose blood is rich (or rather poor) in leucocytes manifest no predisposition to suppuration, nor, when suffering from suppurating surfaces or wounds, do they suppurate more freely or profusely than others whose blood is rich in red corpuscles. Indeed, I think surgeons must have frequently observed, that, when suppuration occurs in patients who are the possessors of rich blood, such suppuration is often, for a time at least, remarkably abundant. Occasionally, also, such patients suppurate, not only freely, but for a greatly prolonged period of time. The rapid and enormous production of pus which is sometimes observed could hardly be accounted for by the wandering-cell theory; for such rapid and overabundant development of the white blood-corpuscles as this rapid suppuration would necessitate is not probable. Were it true that such rapid multiplication was an easy physiological feat, it would seem that physiologists would be able to know

more than is now with certainty known as to their mode and manner of origin.

But, if the pus-corpuscle and the leucocyte are identical, and if the pus-corpuscles in an accumulation of pus are merely wandering leucocytes, something more than an *error loci* is required to constitute the change from leucocyte to pus-corpuscle; for there can be no reasonable doubt that leucocytes wander from the current in the vessels without exciting even a suspicion of inflammation or suppuration. Even passive congestion of a part will, after a moderate length of time, call into action the vagabond character of the leucocyte, and numbers will be found in extra-vascular positions. After the removal of the cause of such passive congestion, as the congestion disappears and the parts return to a normal condition, it is presumable that the wanderers find their way back again into the circulation.

This vagabond proclivity of the leucocyte in passive hyperæmia was experimentally observed by Dr. W. T. Belfield, Demonstrator of Physiology in Rush Medical College, and the experiment made the subject of a paper read by him, in August last, before the National Microscopical Congress. In March, 1878, Dr. Belfield "had occasion to superintend the *post-mortem* examination of a case of pneumonia in which death had occurred on the tenth day of the disease." The symptoms and signs of a typical case had been present. There had been no clinical indication of renal disturbance except a very small percentage of albumen in the urine. Complete consolidation of the entire left lung had taken place. There was found, also, marked engorgement of the kidneys, supposed to be the result of retarded circulation. Curiosity prompted him to make a microscopic section of the organ. The intertubular spaces and the capsules of the Malpighian tufts were infiltrated with leucocytes. Two other similar cases of death from pneumonia without clinical evidence of renal complication occurred within the next six weeks. In both cases the urine contained a slight amount of albumen, but no casts. *Post-mortem* examination here, as in the first case, revealed colorless blood-corpuscles in abundance in the intertubular tissue and Malpighian bodies. These observations led Dr. Belfield to make an experiment upon a frog to determine if purely passive hyperæmia would be attended by the migration of leucocytes. He curarized the animal, cut down upon the femoral vein, and with a rubber band and a bit of cork compressed the vessel

without interfering with the arterial supply, anatomical peculiarities in the frog enabling him to accomplish this with ease. Compression upon the vein was regulated so as to cause congestion without complete stagnation. On prolonged and repeated examination of the web of the foot all the phenomena of leucocytic migration were unmistakably observed.

That the hyperæmia which resulted in this migration was not active was evidenced by an absence of the especial microscopic phenomena which mark inflammation, viz., "the primary acceleration of the blood-current, the subsequent retardation with irregular contractions of the vascular walls, etc.; second, that discontinuance of pressure on the vein was at once followed by complete restoration of the circulation in the web, whose irregularities, therefore, were dependent wholly on a mechanical impediment, and not upon any 'nutritive irritation' nor vascular spasm." Dr. Belfield twice repeated the experiment with a like result.

It would thus seem that the migratory character of the white blood-corpuscle has not, always, at least, the pathological significance or importance which Cohnheim and Billroth attach to it.

But, as already remarked, if the leucocyte and the pus-corpuscle are one and the same body, something more than a mere change of locality must occur to constitute the difference between the two which all must recognize; for it is not probable that the pus-cell could wander, with impunity, back into the current of the circulation, as, undoubtedly, the escaped, but otherwise unchanged leucocyte may. What that change is we can but ascertain by a careful study of pus.

An examination of a good quality of pus reveals the fact that it is composed of a mass of corpuscles remarkably uniform in their appearance and development, constructed upon the type of the colorless blood-corpuscle. These organic bodies which are suspended in the liquor puris challenge our earnest attention in a study of the subject. The grade of organic development is positive, definite, and remarkably uniform. Evidently all have had a common origin; have attained a certain grade of development, beyond or above which they never advance. Now what is their source? Are they the product of a dissolving process in a completely developed and perfected tissue? In order to

answer this question it may be advisable to ascertain what *may* become of such fully developed and perfectly organized tissue.

We know that tissue mortifies and is cast off as a slough, being then disposed of by purely chemical and physical forces. We know, also, that it disappears by ulcerative absorption, the active vessels taking up and carrying away molecular substance as in retrograde metamorphosis, without the advance changes by which integrity of tissue is maintained, taking place. These methods of disappearance of tissue we are positively cognizant of. Do we know of any other? The ancients, Virchow, and even Billroth, say that it dissolves into pus. But pus is an organized substance, the organic grade of which is positive and uniform. Do we know of any instance where organic tissue on dissolving presents simply two constituents, viz., a formless fluid, and, suspended therein, organic bodies all possessing uniformity and parity of development? We can easily appreciate pus as constructive material which has attained a certain grade of development in an ascending scale. Can we regard the reverse of this proposition as at all probable? *i.e.*, Can we think that a perfected tissue can begin a physiological descent in the scale of organization and continue it, step by step, until it reaches the grade of pus, or any similar organism, and then stop with all the material substance showing a parity of organic development as is observable in pus? Is there any instance in which complex organic life exhibits such phenomena? Until this question can be answered in the affirmative it is unphilosophical to assume it in reference to suppuration; and in this view, together with a careful consideration of all the phenomena observable in this pathological process, I feel warranted in denying the assertion that fully organized tissue can be converted into pus.

That source of origin being thus disposed of, let us pass in review the others, all of which are found in some constituent of the blood. It is not necessary in the present state of pathology to consume time in discussing the question whether effused blood and coagula are changed into pus; for certainly blood, as a whole, plays no part in making pus except to make it sanious. Neither is it necessary to consider the other old idea that pus was produced by a secretory process. There remain, then, only two questions to be discussed, viz.:—

First. Was the antecedent condition or status of the organic material, pus, a protoplasm furnished by the blood?

Second. Was such antecedent condition or status merely that of out-wandered colorless blood-corpuscles?

The first of these questions can be answered intelligently if we study the phenomena of suppuration in some locality where healthy suppuration is taking place uncomplicated by any destructive process. We do not need frogs' corneas nor webs, simply irritated, to enable us to study suppuration. We need an *actually suppurating* surface, as already stated, where no destructive complication will embarrass our observation. Such a locality is an open healing wound. Here we can observe all the phenomena. The microscope is necessary only to examine the products of this little physiological laboratory; for we know that the blood comes to the part laden with the unworked material which is delivered here when suppuration is going on associated with only one other process, and that is a process of repair by granulation building. There is vascular activity, but no inflammation. There is active hyperæmia, but not to the extent which embarrasses or oppresses nutrition, but simply serves the process of repair. There is a constant construction of new granulation tissue, and a formation of pus upon the surface of those granulations. If the pus present be washed away with a gentle stream of water, we can frequently see in the minute sulci between the granulations a slightly opaque film of gray substance which clings firmly to the subjacent granulation tissue. If we forcibly tear or brush away this substance, we injure the underlying neoplasm, as is evidenced by the bleeding which follows. If we leave it *in situ* and watch it, we shall notice that it increases in thickness, becomes more opaque, yellow, fluid, and is now pus. Occasionally, on the surface of such a healing wound, when nearly healed, we find, on removing the dressings, that it is covered entirely with a firm, gray layer of semi-solid lymph. If this be peeled off and placed in just water enough to keep it from drying, and examined at the end of twenty-four hours, it will be found to be a mass of unmistakable pus-corpuscles. This proves, in answer to our first question, that the antecedent status of the material, pus, was constructive material, or the blastema of the older physiologists. Whether this blastema be formless, as was formerly thought, or whether it has already begun to be developed while yet in the blood-current, is

immaterial. It is the constructive material out of which granulations are built, and the abortion of which constitutes pus.

In regard to the second question, viz., was the antecedent state or condition merely the leucocytes of the blood which have migrated from the blood current? I have already expressed my disbelief; and to further discuss the question would only be to repeat arguments which have previously found expression in this paper.

The important point which now remains to be considered, whichever of these two views forces itself upon our conviction, is: What is the real nature of the change by which material is converted from its antecedent state into pus? Be that antecedent state protoplasm or leucocytes; or, conceiving that the more elementary protoplasm must first be advanced, while yet in the current of the circulation, to the grade of the colorless blood-cell before it is fit to be offered for assimilation and development into tissue, or degraded into pus; what is the real nature of the change which the material undergoes to become pus?

In order to answer this question it will be necessary to study the present condition and future history of pus. If we examine a specimen of recently formed healthy pus, taking care to collect it upon a warm stick, we may sometimes detect amœboid movements. These movements are, however, not enduring, nor are they to be observed in old pus. Stricker and Ranvier have seen, each in a single instance, the division of a pus-cell. Cohnheim, who credits them with this observation, regards, however, their detection of this mode of multiplication as of little moment so long as the great multitude of microscopists have failed in their attempts to make a like observation. He lays, nevertheless, great stress upon the fact that, in the pus from a wound which has been granulating for eight or more days, among the uniform pus-cells, may sometimes be observed a very limited number of cells from fifty to an hundred per cent. larger than the pus-corpuscle. He imagines that these giant cells have grown by feeding upon other cells! But he acknowledges that they have no future, unless new bloodvessels come to their aid. Evidently their cannibal practices are not favorable to a perpetuation of the species; and as he does not inform us that new vessels are provided for the relief of these monsters, we cannot think that they are destined to greatly modify our present views.

If pus is contained in a closed cavity, it may, occasionally, remain for a long time without undergoing much change. In other instances, even when perfectly inclosed, it becomes putrefied. In all instances pus, even when of a laudable character, rapidly decomposes when exposed to the action of the atmosphere. Pus never rises above the grade of pus. It never plays any part in repairing, rebuilding, or construction of tissue. On the contrary, all the changes which pus undergoes are downward in their direction, and are the result of chemical affinities existing in the elementary matter of pus. It never betrays the least evidence of the presence of a vital force save that indicated by the slight amœboid movements which new pus may occasionally exhibit.

I know that it is quite fashionable, in some scientific circles, to shrug the shoulder and curl the lip at the mention of vital force; to talk significantly about the tendencies of scientific discovery to show that all force is an inherent property of matter, etc. But it cannot be successfully denied that in living organisms there resides a force superior to the ordinary chemical and physical forces inherent to and operating upon the constituents of that organism. By it such inherent chemical and physical forces are restrained and held in subjection. When it is lost these forces resume their sway and decomposition is the result.

In germinal organisms, as, for instance, an egg or the germ or seed of a vegetable, this vital force is latent, but becomes patent under favoring circumstances. Surround the germ by the required influences, and the dormant force arouses from its sleep and springs into active manifestation, exhibiting all the phenomena of life. That these germs possess life-force can be shown only by such life-force responding to stimulation. Unimpressed by the appropriate stimulus, the force remains latent and is finally lost. That such force is not inherent to the physical matter of the germ is easily shown by comparing the behavior of an unimpregnated with that of an impregnated ovum, submitting both to the appropriate stimulus to arouse vital action. Both chemist and microscopist tell us that the two germs are alike; yet one addles and the other springs into vital action because it has been made, by the impregnation, the recipient of a vital force. This is, perhaps, the weakest form of vital force possessed by any organism, yet its presence is easily proven.

Tried by this test, or by any other, can pus be made to exhibit

any evidence of vitality? Does it ever show any of the activities of life? If not, then it lacks vital force; it is dead material, and its future history will be a history of disintegration and decomposition. It is an organic substance which must have *had* life power in order to reach the grade of organic development which it had attained previous to the loss of that power. That loss constitutes death, and we may formulate our creed thus: Suppuration is the formation of pus, and pus is dead or dying blastema. This old term blastema is used in a broad sense, and is intended to designate constructive material which has taken, at least, one step upward in the scale of development. Where that step was taken, whether in the blood current, according to Cohnheim, or in the connective tissue, according to Virchow, is of no consequence in this connection. It may have been in either locality; the fact remains—it *was alive—it is dead*.

We can now answer the question: What is the nature of the change by which material is converted from its antecedent state into pus? The material out of which pus is formed dies and by dying becomes pus. Pus bears the same relation to constructive material that the slough does to living tissue.

The degree of rapidity, or rather tardiness, with which blastema dies, varies even more than does the rapidity with which fully formed tissue dies. Fully formed tissue is, oftentimes, very reluctant to part with its living principle, and remains in a dying state or a state of impending death for a long time before yielding to the domination of physical and chemical laws. So dying blastema, in the cavity of a forming abscess, frequently remains in a dying condition for an indefinite period; but when it reaches that state which is designated by the term "pus," recovery from that condition is impossible, and death and decomposition are the certain sequence.

The pathological nature of suppuration, thus determined, enables us to study appreciatively the dangers which sometimes attend the presence of pus and even other animal substances, both solid and fluid, in certain localities. As poison is developed, occasionally, in the decomposition which takes place in the cadaver and sloughing tissues, so decomposition of pus may be attended by the same result. But as such evolution of septic force is the exception and not the rule in the decomposition of dead animal tissues, so in the decomposition of pus it is comparatively rare that any evidence of the generation of poison is

present. Unfortunately this rarity becomes in itself a source of danger, for it leads surgeons to neglect those precautions which are never out of place and often avert danger. In the cadaver, virus is most frequently the product of a very early stage of decomposition; and it is not improbable that in the decomposition of pus and serum the same rule may obtain. At least the occasional rapid supervention of septicæmic symptoms upon accidents and operations occurring in healthy parts would seem to justify this view.

The danger which attends the decomposition of pus varies exceedingly, and depends upon a variety of circumstances; among which may be mentioned the anatomical structure of the parts in which such pus decomposition takes place, the condition of the system at the time of the accident or operation which occasions the formation of the pus, and the consequent quality of the constructive material from which pus is formed. The hygienic surroundings, also, play a conspicuous part both directly and indirectly.

In an address like this, and before a body of thoughtful and practical men, it is unnecessary to enlarge upon these propositions; but I dwell for a moment upon the last, viz., the surroundings of the patient. It was formerly very generally supposed that, in cases of septicæmia, the virus was furnished by the patient's own wound, except in cases of accidental inoculation. Its persistent prevalence, however, in surgical wards when it has once obtained a foothold, has led to the suspicion that, at least in some instances, the virus was of a more subtle and infectious nature, and was derived more or less directly from emanations from neighboring wounds.

In this connection, perhaps, I may be permitted to introduce the main points of a case which warrants this view. During my service on the surgical side of Cook County Hospital in the summer of 1877, I had occasion to amputate the leg of a patient who was in a fair condition for the operation. The wound healed rapidly, mainly by first intention. After the wound was completely healed except a small superficial space of only one-half inch in its longest diameter, the patient had the first of a series of chills occurring at irregular periods, attended by a high and varying temperature, profuse perspiration, sleeplessness, complete loss of appetite, emaciation, and in the end death. The small unhealed portion of the wound cicatrized, and the

stump remained absolutely healthy throughout the history of the case. Post-mortem examination revealed hepatic abscess. In this particular case, as in others that have led to the suspicion of hospital miasm as a cause of septicæmia, the wound utterly fails to warrant the belief that the virus was furnished by it. With regard to the supposed miasm Billroth has expressed, probably, what will generally be accepted as truth when he says: "I can entirely agree to the miasmatic origin of pyæmia, if by miasm is understood what I understand by it in the present and some other cases, namely, dust-like, dried constituents of pus, and possibly also accompanying minute, living, very small organisms, which in badly ventilated sick-rooms are suspended in the air, or adhere to the walls, bed-clothes, dressings, or carelessly cleaned instruments." In making this quotation, I cannot refrain from expressing my hearty coincidence with Billroth when, in including living organisms in his list of potencies, he uses the adverb *possibly* rather than *probably*.

We now approach the third and last division of our subject, viz., the salutary influences of suppuration. At the risk of inviting an imputation of old-fogyism, I claim for suppuration, under certain circumstances, beneficent influences. In old pathology suppuration was one of the normal terminations of inflammation, and the amelioration of the violent symptoms in local inflammations which followed upon the establishment of that process led to the practice, still in some measure followed, of promoting and encouraging the suppurative process. The seton, which has fallen into almost complete desuetude, produced its salutary influence not alone by counter-irritation, but by exciting and maintaining suppuration, and through suppuration accomplishing elimination. Who of the older surgeons does not remember the beneficial effects which followed almost surely the introduction of a seton into, or in the neighborhood of, diffuse, chronic caco-plastic inflammations?

But my main object, in alluding to the benefits of suppuration, is to invite attention to the post-operation treatment of the wound after extirpation of malignant neoplasms. It is a doctrine venerable with age and honored by almost universal adoption that, after operations for the extirpation of malignant growths, rapid healing, by first intention if possible, should be accomplished.

It was my experience, many years since, in a case where union

by first intention followed an extirpation of the mammary gland, to note an almost immediate return of the disease in the cicatrix. The skin was entirely healthy at the time of the operation, so far as ocular and tactile powers could determine; and yet, in a union by first intention, hardly had the linear cicatrix formed before it began to swell and harden by recurrent infiltration. Similar, though less pronounced, subsequent experience, in marked contrast with the soft, pliant, and healthy cicatrix which usually followed extirpations when, from the extensive loss of integument, the healing was by granulation accompanied by suppuration, led into a train of thought like the following: Malignant growths, whatever general cause may be behind, are accomplished by a perverted and luxuriant local nutrition, in which cells of an atypical character are formed. In such locality this production of atypical cells becomes, so to speak, a *habit* of nutrition, which, after extirpation of the diseased mass, is liable to be perpetuated. If, however, we can interrupt this habit and establish a form of cell-production in which typical cells are constructed, we may, possibly, do much to prevent an early return of the heteroplasm in the original site. This would be accomplished by establishing healthy suppuration in which the typical pus-cell is produced. The local habit of nutrition being now the building of typical forms, the danger of an early recurrence of the disease in this locality is greatly diminished.

Acting upon this theory I have, for a number of years, been in the habit of leaving from one-fourth to one-third of the wound unclosed after extirpation of malignant growths, except in cases where deformity would result from such a proceeding. Into this unclosed portion of the wound, lint has been introduced, and warm water dressings have been applied till suppuration has been fully established. This process has been maintained by resin cerate dressings till healing has become complete. The cicatrices have been almost uniformly soft and pliant, and an early return of the disease in its original site has seemed to have been largely prevented.

If these things be true, and if my reasoning be correct, then is suppuration not an unmixed evil. It is a pathological process which the surgeon may sometimes advantageously invoke in his aid. It is the dangerous nettle from which the flower of safety may frequently be plucked.

PERITYPHLITIC ABSCESS DISCHARGING INTO THE BLADDER AND RECTUM, WITH PATHOLOGICAL SPECIMEN.

By THOS. F. ROCHESTER, M.D.,

BUFFALO, N. Y.

It has been my misfortune to see, in my own practice, many cases of perityphlitic abscess, altogether twenty-three in number. Most of these have terminated fatally, and of these latter, post-mortem examination has been secured in every instance. They have generally been caused by disease and perforation of the appendix vermiformis. It is my belief that, in the great majority of cases, this appendage is in a diseased condition before it receives the foreign body which causes subsequent ulceration and perforation. It is described by Rokitanski, as of catarrhal character, causing general enlargement, and dilatation of its orifice and canal. It may become very thick or very thin in its walls. In the latter case it sometimes shrivels and shrinks entirely away. The foreign bodies are usually gall-stones, many of these very minute, and, formed in the hepatic ducts and taking their imprint by compression, are mistaken for strawberry or other seeds; larger ones are called grape or raisin seeds, or even cherry stones, beans, or other ingesta. Close examination will almost always reveal the gall stone as the nucleus, with phosphatic, fecal, and other intestinal accretions, which make up the bulk, and cause them to be mistaken for objects which they appear to resemble. It is true, however, that real foreign bodies sometimes enter this *cul-de-sac*, one instance, that of the end of a lobster's claw, having come within my cognizance. The attacks of inflammation to which the appendix is subject, frequently extend to the surrounding tissues, and if often repeated, make a wall of circumvallation, which confines the abscess, the result of perforation, within limits, and affords the only possible way of escape from death, either by spontaneous discharge

through some safe line of exit, or by surgical interference. A very remarkable instance of the former will now be detailed to you.

In June, 1875, I was consulted in my office, by Michael Hayes, 28 years of age. He had a swelling in the right iliac region, tender to the touch, and painful all the time, and especially on motion. It appeared to be deep seated and circumscribed, not very prominent, and about as large as an orange. Hernia and bubo being excluded, it was a question between iliac or perityphlitic abscess. I called upon him the next day with Prof. J. F. Miner, prepared to make at least an exploratory operation. To our surprise he informed us that the tumor had subsided, and that he was passing pus and fecal matter by his urethra. Of this he gave us ocular evidence. As this vent had occurred, it was decided to watch the case. Tonics were prescribed and rest enjoined. He remained under observation for six months, and was able to walk about, and even do light work. In January, 1876, he went to Bellevue Hospital, New York, and consulted Dr. Gouley and others, but received no encouragement to undergo an operative procedure. He returned to his home, and was seen by different physicians. He died Sept. 20th, 1878.

Dr. John Boardman, his last attendant, invited me to a post-mortem examination, which he conducted with great care and skill, and to whom I am indebted for the pathological specimen shown. The body was extremely emaciated. There was no swelling in any part of the abdomen. In the right iliac region, the intestines were firmly adherent to each other and adjacent parts. It was difficult to isolate the caput coli. The enlarged appendix was firmly attached to the anterior abdominal wall, and appeared to have emptied itself into an abscess, probably formed by its discharge. The abscess contained about two ounces of fecal matter and pus, and communicated by a large orifice with the bas-fond of the bladder, and by another with the rectum, which was drawn over to the right iliac region; there was also a small channel opening into the caput coli. The abscess had, in fact, four openings, two of ingress and two of egress, and yet so firm were the adhesions surrounding it, that there was no escape of its contents into the peritoneal cavity. It is probable that an early operation would have been successful. It is not impossible that a very late one might have been, even some time after the discharge into the bladder and rectum had

taken place. As none of the organs were found diseased, it is probable that the man died from exhaustion; or, possibly, from purulent absorption. He lived for over three years in a most pitiable state, after the abscess had established for itself partial outlets; and from the information obtained by the post-mortem examination, it is much to be regretted that his urgent and repeated appeals for a surgical operation were not complied with.

TREATMENT OF HEMORRHOIDS BY INJECTION OF CARBOLIC ACID.

By J. R. WEIST, A.M., M.D.,
RICHMOND, INDIANA.

HEMORRHOIDAL affections are so common, and the sufferings they occasion so great, that I need hardly apologize for asking a few minutes of your valuable time, in which to direct attention to a plan of treatment which, though originating, I believe, outside of the regular profession, promises to make their surgical management very simple, and their cure easy. For nearly three years, two or three itinerant "pile doctors" have operated extensively in the West, especially in Ohio and Indiana, for the radical cure of hemorrhoids. They have advertised largely, promising to cure any case of "piles" almost without pain, without danger, and this without requiring the patient to abstain from his regular business. These promises seem very much like those so freely indulged in by "quack doctors" generally, and would merit no attention were it not from the fact that *in this case they are kept*.

More than two years ago, I believe, Professor E. Andrews, of Chicago, discovered and published to the profession the secret method of these operators—a secret that was sold at a high price—which is to throw into one of the hemorrhoidal tumors, by means of a hypodermic syringe, a few drops of a strong solution of carbolic acid. Sometimes "three parts of the crystallized acid to one of any bland oil are employed, but sometimes they are combined in equal parts, and for the oil is occasionally substituted glycerine." The tumor thus treated soon disappears; then another is attacked, and thus in a little while the patient is cured, "without there having been at any one time enough irritation to take him away from his business." Prof. Andrews, in a number of medical journals, in the early part of this year, again called attention to this subject, requesting physicians who

“had opportunities to know the result of this treatment” to give him such information as they had acquired. By this article my attention was directed to this subject, and especially to the plan of treatment followed by one of these “pile doctors,” who, for more than a year, has made monthly visits to a number of the larger towns in Ohio and Eastern Indiana, for the purpose of curing piles by injection. His circulars state that “he treats nearly one hundred cases every week,” and that “he will give one thousand dollars for a case that he cannot quickly and permanently cure, with but little pain to the patient.”

Upon investigation, I learned that from ten to twenty persons were treated by this operator at each of his monthly visits to Richmond, Indiana. I secured the names of a number of these persons, visited them, and made inquiry as to the method of treatment employed upon them, and its effects. Each one related nearly the same story,—“But one tumor was injected at a time. Sometimes there was produced by the injection a sharp burning pain that lasted for a few minutes only; there was little pain or soreness afterward, and the tumor injected soon disappeared.” Most of these persons were well known to me, and some of them I had examined before they had submitted to this new treatment, and re-examination made it apparent that they were cured. At his next visit to our city, I called upon this operator, who seemed willing to give any information desired in relation to his plan of treatment; indeed he operated on half a dozen patients in my presence; the operation was as before described, he using equal parts of the acid and glycerine. The operator stated that he had been at work a little more than a year, and that, during that time, he had made more than twenty-two hundred applications of his method, on between six and seven hundred patients, and that in only two cases out of all this large number had any serious accident followed the operation. In these, serious hemorrhage came on several hours after the operation. These accidents, however, it was claimed, could not be justly charged to the operation, as in both cases there had been serious hemorrhage, before the injection, from ulceration of the rectum. This testimony in favor of the new method of treatment comes, it is true, from one we term a “quack doctor,” yet for various reasons, that would appeal only personally, perhaps, to myself, I am inclined to accept it as true. The instruments used were a metal speculum, cone shaped, closed at

the smaller extremity, with an opening about half an inch wide throughout the whole length of the cylinder, that could be partially or completely closed by a sliding piece, and an ordinary hypodermic syringe, having a long needle, slightly curved at the point, the opening being on the convex surface. Soon after this experience, I made practical application of the treatment, and I have now operated repeatedly, and always with the most gratifying results. I have always used equal parts of carbolic acid and glycerine, injecting only a few drops into each tumor. Patients complain of a sharp burning pain that usually lasts only for a few minutes after the injection. In one case where the tumor was of considerable size, and could not be returned within the sphincter, the pain lasted for about three hours.

Almost immediately after the injection the tumor assumes a whitish appearance, that soon changes to a dark brown.

The first patient on whom I tried the new method was an esteemed member of our profession. I had operated on him about two years before, ligating several large hemorrhoidal tumors; the operation being followed by very great suffering, and dangerous symptoms. A new tumor, about half an inch in diameter, having appeared just within the sphincter, it was injected. There was the usual burning pain for a few minutes, then no further trouble whatever. It would be hard to convince the doctor that the new method of treatment was not greatly superior to the old.

A theoretical objection has been urged against this plan of treating hemorrhoidal tumors: "The injection of coagulants into venous enlargements of other parts of the body has, in a few cases, caused sudden death by embolism, a portion of the clots being carried to the heart, and from thence passing into and blocking the pulmonary artery." It has been suggested, therefore, "that the injection of hemorrhoidal veins may involve a little of the same risk." When we remember the free communication existing between the three groups of hemorrhoidal veins, that the main outlet of the lower and middle groups is to the internal iliac and thence to the heart, while that of the upper is through the inferior mesenteric to the portal vein, it is easy to believe that portions of the injections, or clots, might be swept by the current of the blood to the heart and lungs, or through the portal vein into the liver.

That this treatment can hardly involve any danger from em-

bolism is shown by the fact that "it has now been in use over three years, and has been applied to thousands of cases," yet no accident of this kind has been reported. Had such a result occurred, almost certainly it would have been made public. Nearly all of the operations have been made by ignorant operators, and, had an accident taken place, the regular profession would hardly have allowed it to pass into oblivion. There is other evidence, however, tending to show there can be but little danger in this direction. The belief that the injection of carbolic acid into hemorrhoidal tumors involves danger from embolism is based on the theory that it induces coagulation of the blood in the tumors. That this theory is not sustained by facts may, I think, be clearly shown.

In my first operation, the removal of the needle from the tumor was followed by a fine stream of blood, that was projected for several inches, the bleeding continuing for several minutes. This phenomenon, that I have observed several times since, convinced me that the injection had but little coagulating power on the blood, and this opinion has been confirmed by experiment.

Experiment I. A medium-sized dog was placed under the influence of ether, the left femoral vein exposed, and eight minims of a solution, of equal parts carbolic acid and glycerine, slowly injected into the vein; the only effect observed was a slight quickening of the heart's action, that lasted for a few seconds only. The influence of the anæsthetic having passed off, no ill effect seemed to be experienced. The dog was killed within half an hour, by a blow on the head, and at once examined. The femoral vein from the point operated upon, the corresponding iliac vein, the vena cava, the heart, and the lungs were carefully examined, and no coagula found.

Experiment II. was a repetition of the first, with the same results.

Experiment III. In this case, the same operation was performed as in experiments I. and II., and the wound in the thigh closed by sutures. As soon as consciousness was restored, the dog began running about, suffering no apparent inconvenience from the operation beyond the local soreness. The wound soon healed, and he continues perfectly well now, about six weeks after the operation.

Experiment IV. was a repetition of No. III., with the same result; the animal is still alive, and in good health.

Experiment V. Ten minims of the solution used in the previous experiments were injected into the right iliac vein of a dog; half an hour later the animal was killed, and an examination of the vein, vena cava, heart, and lungs made, as in experiments Nos. I. and II., and no coagula found.

Experiment VI. A medium-sized dog was placed under the influence of ether; the chest opened and the heart exposed; ten minims of the carbolic acid solution were injected into the inferior vena cava an inch below the heart; violent and rapid contraction of the heart, lasting for three or four seconds, followed the injection; rhythmic contractions followed, and continued for twenty-one minutes. The same search was made immediately after death for coagula, as in the previous cases, with the same negative result.

Experiment VII. The right iliac vein of a dog was exposed, and two ligatures placed upon it two inches apart; the portion of the vein between the ligatures was filled with blood; into it were injected six minims of the usual carbolic acid solution; two minutes later the part of the vein injected was opened, and found to contain besides fluid blood a very small amount of almost undetectable coagulæ.

These experiments seem to show, that carbolic acid has almost no coagulating power on the living blood contained in the veins, and that its presence in the blood, in limited quantities, at least, produces no serious disturbance of the animal economy.

I desired, in connection with the experiments reported, to study the changes produced in the vessel itself at the point of injection, the action of the injection on the corpuscular elements of the blood, and the changes following the injection of hemorrhoidal tumors, by a study of sections of these tumors themselves, but I have been unable to do so in the limited time at my command.

I content myself, therefore, with thus calling the attention of the Section to this method of treating hemorrhoidal tumors, in the belief that further investigation will show it to be superior to any that now has the sanction of the profession.

After this paper was written, and just before leaving home, I received the Cincinnati *Lancet and Clinic*, of April 26, containing an article on the "Cure of Hemorrhoids by the Hypodermic Syringe," by Prof. E. Andrews, of Chicago. This article states, "that, in response to a published request for information from all physicians who have any knowledge of the practical results of the treatment, replies have been received from about 300 physicians, giving more or less knowledge of the results of 3304 cases treated by the new method; out of this number, 184 accidents are reported. Those of special interest are the following, viz.:—

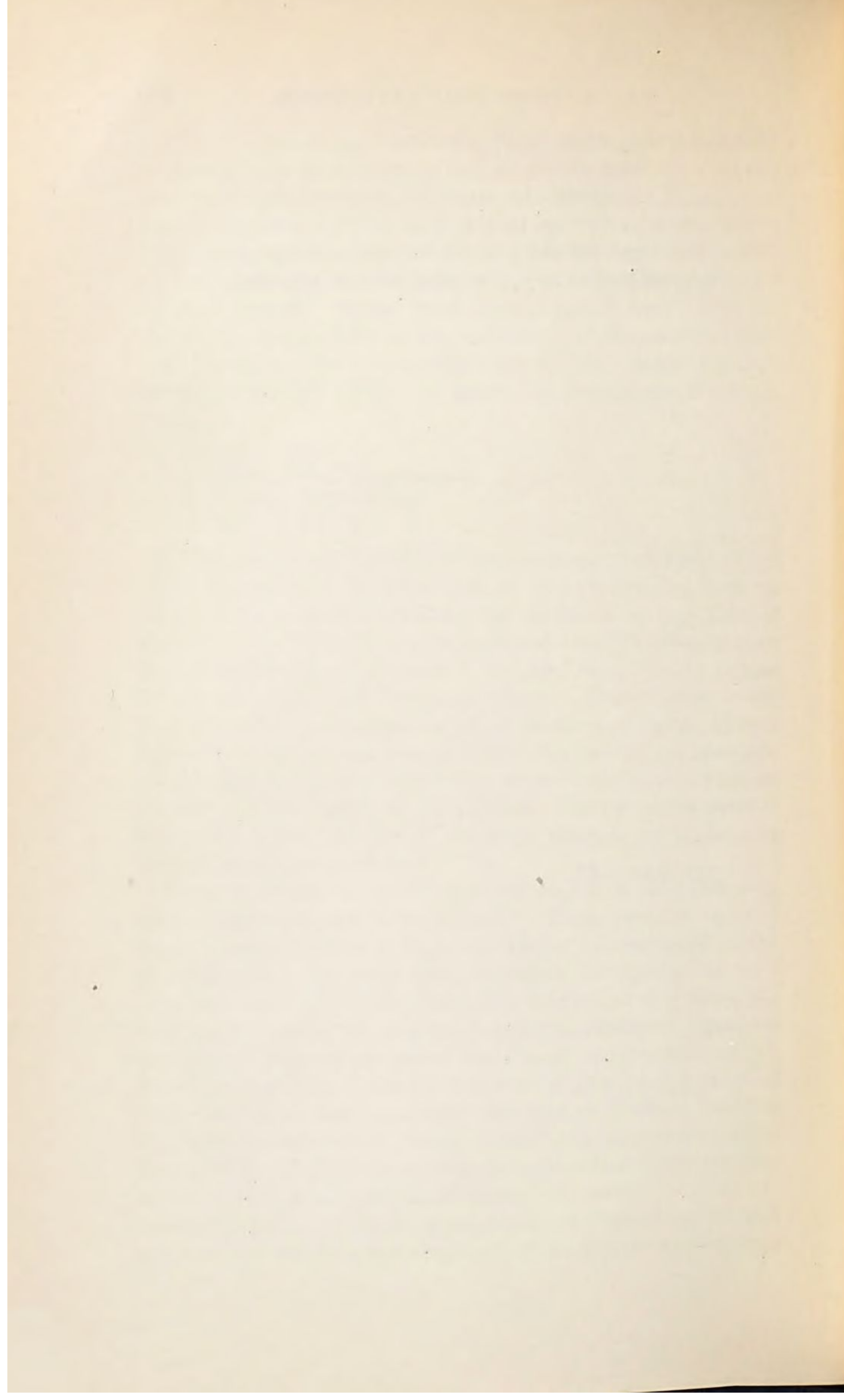
Deaths	9
Embolism of the liver (suspected)	8
Very dangerous hemorrhage	5
Abscess (of the liver)	1

An examination of the table of accidents reported, leads to the belief that some of the physicians, at least, furnishing these reports, were desirous of making out as bad a case as possible against the new method. For instance, the 184 cases of accident reported include 83 cases of "violent pain," 11 of "failure to cure the piles," and 7 cases of relapse. This opinion is further supported by an examination of the cases of death. There is no report of post-mortem examinations, and no evidence presented that shows any connection between the injection of the tumors and the death of the patients. In two cases death is attributed to the injection of the large prostate, by mistake for a large hemorrhoidal tumor!

Three cases are so vaguely reported that it is said they may "possibly refer to the same patient." These cases of reported death after the injection of hemorrhoidal tumors afford no aid in determining how much danger attends the injection of such tumors with carbolic acid; for, while it is stated that this agent was the one generally employed, a great variety of injections were used. Among the others mentioned, are creasote, chloral, iodoform, ergotine, muriated tincture of iron, persulphate of iron, tannin, chromic acid, and tincture of iodine. There is still more uncertainty in relation to the cases of supposed embolism of the liver; there is no evidence given that shows the condition to have existed in any of them.

Most, if not all, of the dangerous cases of hemorrhage are said to have occurred from allowing the patient to take at once long

rides and walks, when he should have been in bed. If all the accidents reported could be justly charged to the method of operating, it would still be true that, in the hands of ignorant pretenders, who operate in the most reckless manner, the injection treatment for the cure of hemorrhoids has given more favorable results than any other method now practised.



ASPIRATION OF KNEE-JOINT.

By HENRY O. MARCY, M.D.,

CAMBRIDGE, MASSACHUSETTS.

THE landmarks of our fathers in surgery have become of small value in these days of careful inquiry and patient research, of radicalism and reform. Little respect is paid to dogmatic teaching. Old truths are reëxamined, sifted from error, and associated with new facts in such a way that new teachings are evolved, and the "thus far and no farther" of even our student-days is no longer heeded. A learned bookseller of Berlin once replied to my inquiry as to why he did not keep medical books, that "you doctors burn your books every ten years, and I cannot afford to keep such perishable property." May we not accept it as a compliment to the progressive spirit of our profession?

Many before me were taught that the peritoneum was sacred from the ante-mortem touch of the scalpel; yet to-day it is subject to surgical manipulation almost without fear, and, with proper care, without serious danger.

Most of us were taught, that accumulations of fluid in the pleural cavity should not be surgically interfered with; and our honored ex-President, Dr. H. I. Bowditch, of Boston, whom I am proud to claim as the master of my pupilage, was subject to criticism and reproach, almost ostracized by the conservative leaders of the Boston profession, for believing these fluids could be withdrawn with benefit, and daring to put his theories to the practical test. Ten years ago, when a student in the wards of Professor Frerich, of Berlin, I told him of the large experience and surprising results obtained by the withdrawal of fluids by the use of the Bowditch and Wyman instrument;—he went before his class and lectured for two hours, reviewing the entire subject, with its history from the ancients to the present, but

ended as he commenced, by saying it was a "Schwerer Frage," a most difficult question.

The instrument of Dieulafoy, with its finer needles and exhaust bottle, opened up greater possibilities, and avoided many dangers, in the evacuation of fluids from closed cavities. This, seconded by the enthusiastic and indefatigable spirit of its inventor, called the attention of the profession all over the world, early to the advantages of the new instrument, and placed it in the hands of a large proportion of surgical practitioners. With it new experiences have arisen, and naturally its use in the synovial effusions of the joints was suggested, especially that of the knee so long and familiarly known as "white swelling."

The surgical experience of two thousand years had taught the extraordinary danger to limb and life of injuries to the knee-joint which opened its cavity, and no one principle in surgery had been better settled, for many generations, than that of non-interference with the accumulations of fluid within the joint. Under the influence of such conservatism, it is no wonder that the question is still *sub judice*, and that many of our wisest and best surgeons still believe that medical and external applications are the only advisable means to be employed in the treatment of such affections.

Owing to the novelty of the question not much has been written upon the subject. Prompted by my own experience, on the 1st of April of the present year, I addressed one thousand circular letters to the surgical profession of America, hoping, by multiplied experiences, to aid in settling a question of so much importance, and, if treatment by aspiration is advisable, to define its limits and possibilities. I wish at the beginning to thank the members of our profession for the very general interest shown in the investigation, and for the valuable material placed by them at my disposal.

Subjected to the influence of my previous teaching, I had never used the aspirator for the removal of fluids from the knee-joint until May, 1876, although I had long regarded the instrument as one of my most valuable aids in surgery. Since that time I have treated twelve joints and aspirated forty-five times in ten cases. The histories I will briefly reproduce here.

CASE I. J. C., aged 34, married. When a soldier in the English army he contracted gonorrhœa, from which a stricture re-

sulted. A fresh gonorrhœa was followed by an attack of inflammation of the joints, and a sudden enlargement of both knees with fluid. The pain from distension was so great that very large opiates gave little relief, and I feared the most serious consequences from the violent inflammatory symptoms.

None of my medical friends could aid me by their experience, and I found only the following brief note in Bryant's Surgery: "Paracentesis of the joint is an operation that has been performed, and, in the hands of some surgeons, with wondrous success. Dr. Foyrer, of Calcutta, is one of its strongest advocates, having shown that, in the chronic and subacute forms, much good is often obtained by the operation, if care be taken to exclude the air by carefully closing the puncture and fixing the joint on a splint. The drawing off of the fluid affords instantaneous relief. I have performed this operation once, with a good result, in a case in which tension of the joint was extreme; and in another case, operated on by Mr. Cock, a similar result was obtained. It is a practice, however, that ought to be followed with extreme caution."

I ventured to aspirate, first one joint, and with such relief that the patient demanded that the other should be tapped. The temperature immediately fell, the pulse lowered, and sleep followed. The effusion, however, quickly returned, the pain from distension was as great as before, and I was besought to remove the fluid, which I did thirty-six hours after the first operation. The liquid withdrawn was of the same character as at first,—serous, showing microscopically a few exudation-corpuscles and blood-cells. On the third day the operation was again repeated; and again and lastly, six days later, being eleven days from the first tapping, when the secretion suddenly ceased. By the twenty-first day from the first operation the patient was convalescent. He could walk without much lameness, had good flexibility, and no relaxation of ligaments. He was soon at work, and has continued until now as well as before the attack.

The quantity of fluid was, from over six ounces at first aspiration, reduced to four at last aspiration, and the amount removed from each joint was from twelve to fifteen ounces. Considering the cause, character, and severity of the inflammation, I could but conclude that the result was remarkable, and largely to be attributed to the means employed.

CASE II. Acute rheumatic inflammation of one knee. Three

ounces of serum were removed. No re-accumulation of fluid, and the patient was speedily convalescent; result perfect.

CASE III. Acute rheumatic inflammation of one knee. Twice tapped, January 31st and February 7th. Plaster splint. Fluid did not re-accumulate; convalescence rapid; result perfect.

CASE IV. Acute gonorrhœal. Patient had previously had a severe attack of gonorrhœal rheumatism, and recovered with a weak knee, internal lateral ligaments relaxed, and the limb bent inwards. Aspirated twice, and immovably fixed in plastic splint. Recovery slow; the joint much as before the attack,—weak, and mobility limited.

CASE V. Traumatic—fractured patella. Fluid bloody. Plaster splint. Fluid did not re-accumulate.

CASE VI. Acute inflammation. C. S., aged 36, previously healthy. Seized with a chill June 28, 1878. Pulse 112; temperature 103° , joint of left foot intensely painful, almost no sleep since attack. Seen on the 30th. Aspirated five ounces and two drachms of clear serum, exhibiting microscopically a few exudation-corpuscles and blood-cells. At once applied a plastic splint, extending from toes to groin with wide fenestræ over knee. Opiates. Re-aspirated as follows:—

July 1,	6 ounces 2 drachms.		
“ 2,	5 “ 6 “		
“ 3,	3 “ 3 “		
“ 4,	4 “		
“ 5,	4 “ 1 “		
“ 6,	3 “ 1 “		
“ 7,	3 “ 4 “		
“ 8,	5 “	slightly purulent and somewhat bloody.	
“ 9,	3 “ 6 drachms.		
“ 10,	3 “ 6 “		
“ 11, A.M. 2	“ 4 “	specific gravity 1040.	
“ 11, P.M. 2	“ 6 “	“	1012.
“ 13,	1 “ 4 “	“	1016.
“ 15,	4 “ 1 “		
“ 16,	3 “		
“ 18,	3 “ 4 “		
“ 20,	1 “ 4 “		
“ 23,	2 “		
“ 29,	2 “		

In all nearly seventy ounces removed in thirty days. During this entire period absolute rest was enjoined, the ice bag was continued most of the time day and night, leeches were freely used, and iodide of potassium, bark, and opium taken internally.

The temperature varied, but was continuously above the normal, usually from 100° to 102° ; the pulse corresponded with the temperature. The patient was a very intelligent man, of decided will; and the relief which he experienced from aspiration was so great, that my only difficulty was in prevailing upon him not to have the operation repeated oftener. My careful study of the character of the fluid, together with the fact that usually both temperature and pulse fell after aspiration, led me to feel safe in repeating the operation frequently, and also convinced me that the quantity of fluid was one of the important factors in the production of constitutional suffering.

The secretion of fluid ceased quite suddenly, and rapid improvement followed. A considerable degree of stiffness remained for some weeks, and a few adhesions were broken up under ether. Convalescence went steadily on until for some months now the flexibility of the knee has become quite equal to that of its fellow, and the articulation perfect.

CASE VII. Septic poisoning. Fluid slightly purulent; three times aspirated. Plaster splint. Knee improved, and fluid ceased to accumulate, while disorganization and disarticulation of the hip-joint of the same side went on *pari passu*.

CASE VIII. Acute gonorrhœal rheumatism. Twice aspirated; recovery slow.

CASE IX. S. W., aged 23. Healthy family, and himself strong until after graduation in 1876. In July his left knee was acutely inflamed, with a marked effusion. In 1877 right knee, both elbow-joints, and several of the phalangeal articulations were involved, with effusion. He was under the best of general care, taking a trip to the Azores, etc., without much improvement. Limbs weak, lateral ligaments relaxed. Both knee-joints were aspirated March 7th: left knee, three and one-half ounces of pale fluid, specific gravity 1016, with a few exudation-corpuscles; right knee, three ounces, containing also a few blood-cells. Plaster splint on left limb, elastic bandage on right. Re-aspirated April 15th and 30th; slow improvement; has been allowed to resume a part of his duties as a teacher, but is still under treatment.

CASE X. Inflammatory, of six months' standing. Aspirated three times within a month. Plaster splint. Convalescent in six weeks; patient at work, with free movement of the articulation.

I have used the aspirator as made and essentially modified by

Codman & Shurtleff, of Boston. This instrument is to be commended for its careful workmanship, simplicity, and the ease with which it is kept in reliable order. Of all the aspirators which I have seen, either American or of foreign manufacture, I believe this decidedly the best. With one exception, I have used the No. 1 or smallest-sized needle.

The following are the reports of cases received in answer to my circular above mentioned.

Dr. WILLIAM INGALLS, of Boston, has operated in eight cases; five acute, from injury, and three chronic; with fourteen aspirations, twelve in the hospital, and two in private practice. Treatment: Rest; hard splints; in three cases dry sponges were applied after the aspiration, with bandages over and water to sponges to make them swell, thereby securing uniform compression; in one case extension was used. Opinion: "Favorable to the operation. Almost all cases present a condition which seems to demand a release of fluid by some means. My case in private practice, three and one-half years ago, was that of a lady who had been very fond of dancing and walking much. Both knees. I had reason to suspect erosion of cartilages, but think now I was mistaken, as she can walk two hours without a cane. About two years ago, there was evidence of fluid in both joints; aspirated, compression, moderate extension. Three ounces of serum were taken from one knee, one ounce from the other."

The following were hospital cases.

CASE I. E. P., aged 16. Acute synovitis. Entered April 30, 1875. Aspirator-needle passed into knee May 2d; one ounce of serum withdrawn. Swelling did not reappear. Well May 17th.

CASE II. T. B., aged 35. Acute synovitis of knee. Entered April 21, 1875. Knee aspirated on the 25th; two ounces of purulent serum. Swelling returned; knee re-aspirated May 18th, but no fluid obtained. Swelling diminished, and patient discharged, relieved, May 28th.

CASE III. J. C. Subacute synovitis of knee. Patient entered May 12th, having been kicked by a horse. Aspirator-needle passed into knee May 14th; four ounces of sero-sanguineous fluid withdrawn. Patient discharged, well, June 3d.

CASE IV. 1879. An old gentleman, with chronic enlargement of left knee. Aspirator-needle passed on outside, with no result;

on inside, two ounces pus with serum. Patient still under treatment.

CASE V. J. H. Acute synovitis from injury. Entered April 12, 1877. Knee aspirated on the 16th; four ounces reddish serum withdrawn. Re-aspirated April 20th; four ounces again. Discharged, relieved, May 24th.

CASE VI. J. F. Entered July 11, 1877. Chronic synovitis of knee. Aspirated on the 12th; four ounces of serum. Discharged, well, September 15th.

CASE VII. T. H. Acute synovitis of knee. Entered June 25, 1878. Aspirated on the 27th; two ounces of sero-purulent fluid: re-aspirated the 30th; three ounces more fluid withdrawn. Discharged, relieved, August 5th.

Dr. A. J. FULLER, of Bath, Maine, reports five cases, with six aspirations. Cases mostly from injury and inflammation following. In all cases but one, the fluid withdrawn was pale yellowish serum, varying in quantity from one to four ounces. Treatment, rest and absorbent remedies. In the case of re-aspiration, there were three ounces of serum; result, favorable, with slight stiffness for a few months. The period of recovery varied; generally, the use of the limb quite satisfactory.

"I should recommend aspiration when other treatment failed to produce the required result. Should prefer those cases where the trouble was the result of accident. I feel safer with aspiration than with any other method; still, think it should be practised with caution, as inflammation might result in permanent injury to the joint."

Dr. N. SENN, Milwaukee, Wis., reports six aspirations in five cases—one of acute synovitis, one rheumatic, and three inflammatory. From one to four ounces of serum taken. Treatment, rest in fixed position, pressure by elastic bandage or adhesive straps, and, later, massage and passive motions. Results, in old cases of long standing some stiffness, but in none ankylosis.

"I think aspiration one of the most useful operations in chronic effusions, in acute cases where pain is not controlled by usual treatment, and in subacute and chronic cases which do not yield to absorption. In suppurative synovitis, I consider aspiration only useful for its diagnostic value.

"Have re-aspirated in some instances several times, but fluid reappeared. In these cases, I prefer an incision and drainage under antiseptic spray and dressing."

Dr. H. B. WHITON, of Troy, N. Y., has aspirated five times in four cases—two traumatic and two inflammatory. Duration of one year to eighteen months in three cases, and of but one month in one case. Quantity of fluid one-half ounce to six ounces, synovial and muco-purulent. Treatment, rest, blistering, and iodide of mercury. Re-accumulation of fluid in one case, from overwork, after a period of nearly one year. Re-aspirated, and withdrew one ounce of fluid. Cure complete, and in all cases a perfect joint.

“I should always advise aspiration whenever I could have absolute command of the patient, to secure a complete rest. I would not limit the operation, except in cases of extreme feebleness, and associated with constitutional disease of an aggravated type. I consider it just as safe to aspirate the knee-joint as to aspirate the great cavities of the bladder.”

Dr. WM. M. FUQUA, of Hopkinsville, Ky., has operated twice by aspiration, and twice by incision. Three were traumatic cases, one resulting from erysipelas. Fluid withdrawn, from eight ounces to three drachms of healthy serum. Co-operative treatment, extension by weights, fomentations, elastic bandage, rest, and immobility—by splint—if required. Convalescent in about thirty days. Subsequent condition good; limb safe; flexibility impaired, yet locomotion well performed.

“I would advise always to remove imprisoned fluid by aspiration, if possible. I do not fear atmospheric air. The aspirations, to do good, must be done early. I would not limit the operation to any class of cases. Passive motion was used just as early as the cases would admit of it. When the joint was opened by incision, carbolic acid solution was used once daily. Patient was sustained by good diet, and stimulants, if required; opium at night; and supported by pretty firm bandage—elastic, if preferred.

“This is surely an important subject. When I first dared to open the knee-joint, my medical brothers were appalled, and aspiration of the hip-joint was regarded in the same light. Is it not our important duty to give an outlet to pus in lumbar and psoas abscesses also?”

Dr. G. E. CENTER, Evansville, Indiana, reports four cases, two of which were traumatic. Quantity of fluid from one to four ounces, purulent, with blood. Treatment, rest, starch bandage, opium, iron, and quinia. Convalescence in from two to twelve

weeks. The joint useful; in one case the ligaments contracted, and tenotomy was performed; the other three cases all right—all flexible; in one the usefulness of the limb impaired for two months.

“I think the operation advisable—nothing equal to it in effusion of the knee-joint. Before I had an aspirator, I was called forty miles to see a man, aged 28, with synovitis of the joint. Patella was raised up, and there was fluctuation. With a sharp-pointed scalpel, I made a free incision at the lower and inner side of the patella. Evacuated three ounces of pus, and two of blood and pus. Then I removed the scalpel, which had a small octagon handle, passed it into the wound, and could see and feel it pressing out the skin on the opposite side. Gave him a small glass syringe, and a five per cent. solution of iodine in water to inject twice daily; also, gave tincture of chloride of iron and quinine. Within two months he had as perfect use of the joint as before the injury.

“I have aspirated pericardium twice, brain (hydrocephalus) twice, pleural cavity and abdomen often.”

Dr. F. P. PORCHER, of Charleston, S. C.: “I have aspirated three times in two cases—one traumatic, one rheumatic. There was considerable distension. Fluid taken considerable, of sero-albuminous character. Swelling reappeared in one case, in about twenty-five days after aspiration; re-aspirated once, and cured.”

“I am very favorable to aspiration in all cases where there is an accumulation of fluid of almost any description. Aspirated once for pericardial effusion, four times in pleuritic effusion.”

Dr. J. S. BUIST, Charleston, S. C.: “I have aspirated four times, in three cases—two traumatic, one inflammatory and rheumatic. Fluid taken from three-fourths to one-half pint of serum. First case of six months’ duration, second nine, and third six months’; and, in all, distension considerable. Treatment, rest, plaster-of-Paris bandage, and large doses of iodide of potassium and iron. In the first case there was a complete recovery, but in the other only partial.

“I think the operation eminently proper, and that it should be practised in all cases from mechanical injury. Rest after aspiration is a *sine qua non*,—plaster-of-Paris bandage extending even to the hip-joint.”

Dr. R. REYBURN, Washington, D. C., reports two cases, with three aspirations; one case acute traumatic, and one rheumatic. Fluid synovial. Treatment, rest and iodine. In the first case

accumulation re-appeared; re-aspirated, with most excellent results. The first case was restored in six months, with slight ankylosis; the other was slightly stiff at first, but good use of limb finally resulted.

“I consider aspiration one of the greatest advances of modern surgery, and applicable in all cases except where there is very evident acute inflammation of the joint, when I would wait a little, until the inflammation had obtained its maximum and the joint was well filled with fluid.”

Dr. J. P. THOMAS, Pembroke, Ky. Six aspirations in three cases—two traumatic and of four weeks' duration, one rheumatic and of only one week's duration. In the first case, before bandage was applied, there was re-accumulation twice, within a week each time; but, after equable compression, there was none. Re-aspirated first in ten days, then in twelve days. The first case recovered in three months; was not retarded but benefited by the aspirations, and good use of joint was secured.

“In any case of extreme effusion of traumatic origin, I would aspirate the joint. In cases of rheumatic or syphilitic origin, I would be tardy, but, if other measures failed, would not hesitate. I believe the early resort to the operation prevented the absorption of the tissues and consequent effusion of plastic matter in the fluid, and, to have waited in these cases for the process of absorption, would have resulted in complete ankylosis of the articulation. This may be an error, but certainly there would have been great injury to the ligaments and consequent flexibility of limb. As it was, there was no impairment in usefulness. The bandage, when properly applied after aspiration, I believe will prove sufficient to prevent any re-accumulation. I have had no experience in aspiration of any but the knee-joint, but should not hesitate in any joint not quickly yielding to absorbents with proper compression.”

Dr. C. M. WEST, Rome, N. Y., reports two aspirations in a case of pyæmia following otitis, in a man sixty years of age. Two or three weeks' duration; joint very painful, and considerably distended. Withdrew nearly one-half pint of thin pus. Re-accumulation in one week; re-aspirated, and withdrew six ounces of pus as before.

“I should repeat the operation under similar circumstances. I have freely opened the knee-joint in a case of acute traumatic synovitis, with a large discharge of pus, and immediate relief

of violent symptoms that threatened early death. The patient recovered, and has an excellent limb."

Dr. MOSES GUNN, of Chicago, Ill., reports one case of purulent effusion into the knee-joint, treated by aspiration. Removed four or five ounces; twice re-aspirated; each time fluid less purulent and in less quantity. Recovery perfect.

Dr. J. J. CALDWELL, of Baltimore, Md., has aspirated in two rheumatic cases of over a year's duration. Fluid synovial, straw-colored. No re-accumulation. The joints gradually reduced in size, and recovery good.

"I regard aspiration the best method of treatment offering itself in the present status of surgery, and consider the operation one of the greatest advances of modern times."

Dr. R. A. KIMBALL, Charleston, S. C., has twice aspirated in one traumatic case of many months' duration. Withdrew about six ounces of fluid. Absolute rest enjoined, and plaster-of-Paris bandage applied after aspiration. There was re-accumulation after removing bandage. Re-aspirated, and bandage again applied for three weeks. Result good.

"I think the operation should be recommended where there is simple effusion in a chronic state, with no evidence of disease of bone or cartilage, nor great thickening of synovial membrane."

Dr. J. E. MUMFORD, Princeton, Indiana, reports one case, of traumatic character. Withdrew two ounces of serum, with flakes of lymph; then treated with pressure and bandage. After the operation there was steady improvement until entire recovery; functions of the joint not in the least impaired.

"I shall certainly avail myself of the operation hereafter in the treatment of synovitis. My impression is, that the presence of fluid above the joint should be the indication of its use without regard to causation. My use of the aspirator in this case was not suggested by having seen any mention of its employment for such purpose. I was much pleased with the result, and am glad that there is a prospect of having the matter presented to the profession."

Dr. S. B. WARD, Albany, N. Y., reports two cases, one of which was traumatic, the other rheumatic, the first of five months' duration, and the second of two months'. In the first case three ounces of fluid were taken; two ounces of clear straw-colored serum from the second case. Treatment, rest,

elastic pressure with rubber bandage. Slight re-accumulation, but gradually disappearing. Recovery, with both joints flexible and apparent complete usefulness of limb at the end of two months, in both cases. His opinion is favorable to the operation.

Dr. D. SCOFIELD, Washington, Iowa, reports one case of traumatic inflammation, of three months' duration. "I withdrew three to four ounces of fluid; then used compression, and iodine applied locally. I do not see why the joints may not be almost as safely incised with care. I would advise aspiration in those cases where the fluid is not purulent, and the distension so large as to endanger the integrity of the joint by pressure, or to cause suppuration in adjacent parts."

Dr. W. S. DUNCAN, Brownsville, Pa., reports two cases and four aspirations. Withdrew three ounces of yellowish, non-transparent serum; then used splints, with rest and laudanum, quinine and iron internally. There was a re-accumulation of about three ounces in three weeks. Re-aspirated, in four weeks, about three ounces of purulent fluid; three weeks after, two ounces of serum with a little pus. The splint was kept on about a month after the last aspiration. Perfect use of the joint resulted.

"I would aspirate any joint containing fluid, if I thought there was danger of serious injury to the cartilage or bone. In another case a horse fell on a gentleman's knee. I aspirated, taking four ounces of bloody serum from the joint. Kept him quiet two weeks, when he returned to his business."

Dr. H. A. WEST, Galveston, Texas, reports one case of traumatic character, and from two to three months' duration. A large quantity of thick, clear, straw-colored fluid was withdrawn. The after-treatment included rest, blisters, and iodide of potassium. The case recovered, with an excellent condition of the joint, in about three weeks.

"I can see no reason why aspiration should not be resorted to in effusions of the joints as well as in other conditions. It is certainly more effective and more rapid than the local or internal use of remedies to promote absorption."

Dr. G. B. BULLARD, St. Johnsbury, Vt., reports one case, traumatic, of three months' duration. Withdrew four ounces. Rest. In three months, limb restored to usefulness by passive motion. He would advise the operation whenever certain that the joint contains fluid which will flow through a small aspirator-needle.

Dr. WEIR, of New York City, reports three aspirations in two cases—one traumatic, one sero-purulent. “In the first case, there was a re-accumulation, and I re-aspirated; suppuration ensued, it opened, and death followed. In the second case, there was a perfect recovery. I think well of the operation, but aspiration, in obstinate and rapidly progressing synovitis, should be associated with antiseptic precautions.”

Dr. SABINE reports two cases at St. Luke's Hospital, and Dr. BELL two cases at Chambers Street Hospital, but their histories were so imperfectly taken as to be of no value.

Dr. G. H. GRAY, Meriden, Conn., reports one case, of syphilitic character, still under treatment. “Have withdrawn two ounces of thick pus, of a greenish color. In this my first case of aspiration, I cannot profess to offer any experience of value; can at present only say that my case is doing well. I have seen the operation performed in the London and Paris Hospitals; but, with what permanent results, cannot say.”

Dr. J. M. SHARKEY, San Francisco, Cal., reports one case, inflammatory, of six months' duration. Withdrew a large quantity of synovial, semi-opaque fluid. Convalescence took place in about four weeks; joint weak several months. He would not advise aspiration unless other remedies failed.

Dr. J. T. HODGEN, St. Louis, Mo.: “I can only say, I have aspirated the knee-joint repeatedly, always for a subacute, non-traumatic synovitis. I have never had an accident or bad result, but have not kept a record of cases.”

Dr. C. K. THOMPSON, Wellsboro', Pa.: “I have never aspirated in synovitis, but shall do so the very next opportunity that occurs.”

Dr. H. I. BOWDITCH, Boston, Mass.: “I have no experience in such cases, but, *a priori*, with Dieulafoy's extensive experience, I see no reason why the treatment should not be employed.”

Dr. W. P. BOLLES, Boston, Mass.: “I am sorry that I cannot help you in the research. I believe it is a valuable method in many cases.”

Dr. I. H. CHATHAM, Seymour, Indiana, writes: “I have never aspirated, but shall do so when an opportunity occurs. I deem it very important as a means of diagnosis, and in many cases the safest and most successful method of treatment. My experience is not sufficient to give an opinion as to the limit to which aspiration may be used in the removal of pathological fluids,

with safety; but I have aspirated successfully for nephritis and psoas abscess, strangulated hernia, retention of urine, ovarian cysts, and dropsy of the abdomen, and I must say my experience has been highly satisfactory in every instance."

Dr. R. N. TODD, Indianapolis, Ind.: "I have never performed the operation, but have no doubt that it will prove as efficient in these cases as in effusions elsewhere. The injury constantly wrought by the pressure of abnormal fluid, we know to be disastrous. I regret I have no clinical experience to give you."

Dr. WILLIAM LOMAX, Marion, Indiana, writes: "I once incised the knee-joint in a case of injury from a pistol-shot. Withdrew probably one ounce of synovial fluid and blood. Then I fixed the limb upon a long splint as much elevated as could be borne; applied cold water freely. Convalescence took place in about two months; joint ankylosed for a time, but recovered good motion ultimately. I am favorable to aspiration in good constitutions."

Dr. LEWIS A. SAYRE, of New York City, writes: "I have had no experience in aspiration of the knee-joint. Have frequently opened the joint by a free incision in cases of chronic effusions or suppuration, and always with good results. In fracture of the patella accompanied by great effusion, I should aspirate, in order to bring the protruded bones together; and in large synovial effusions that could not be absorbed, the aspirator is useful; but in purulent collections there are often such large flakes which cannot escape by the aspirator, that I prefer incision."

Dr. W. S. THORNE, San Jose, Cal.: "I believe the operation dangerous and unnecessary in ordinary synovitis. I think it should be limited to those cases of purulent synovitis that have resisted all other methods. I consider aspiration unwarranted in the treatment of serous synovitis: *first*, because a large number of accidents to life and limb have resulted from its use; *secondly*, its reputed and most authentic results compare unfavorably with the method of immobility with pressure. Perfect and absolute rest, with bandages applied as closely as the circulation will tolerate, equably and conformably maintained, will, after the acute stage has been subdued by the ice-bag, give perfect results in a vast majority of cases."

I have contented myself with quoting freely from a review of the foreign literature upon the treatment of effusions into

the knee-joint, published in the *Boston Medical and Surgical Journal*, by Dr. E. H. Bradford, of Boston:—

Dieulafoy reported, one year since,¹ that he had aspirated the knee-joint two hundred times. He believes the operation is a rational and efficient one in a large class of cases. He uses the No. 2 needle, first placing a rubber bandage around the knee, leaving uncovered the place of puncture. His point of election is the external cul-de-sac of the joint, on a level with the upper border of the patella and about two centimetres outside of this bone. Compression is used as soon as the fluid is evacuated, by a flannel bandage applied from the foot up to the thigh. This is removed in twenty-four hours, and, if fluid has collected, it is re aspirated.

The number of aspirations needed varies greatly. Bloody and other effusions into the joint following external injury, usually disappear rapidly, and require but one or two aspirations before a cure is effected. Sero-fibrinous exudations (hydrarthrosis) vary in the number of aspirations from one to six, but, though the treatment is long, the time before recovery is certainly shorter than that during treatment in any other way. Blennorrhagic hydrarthrosis is much more obstinate than any other form. More aspirations are needed before recovery, and the exudation returns quickly.

Scriber, of Baden, advises incision and drainage of the knee-joint in chronic serous inflammation; in chronic disease of the knee-joint with granulation, where there is effusion and no caries; in acute purulent affections of the joint with evident fluctuation; and in acute serous effusions, when the pain is so severe as to exhaust the patient. Incisions are to be made on both sides of the patella, and a thick drainage-tube is inserted; before the insertion of the tube, the joint is to be washed out with a solution ($2\frac{1}{2}$ to 5 per cent.) of carbolic acid. In chronic cases, if there are sinuses and feter, a solution of chloride of zinc (12 per cent.) is used instead. The operation is to be done according to the strictest antiseptic precautions. In acute cases the tube should be removed in three or four days if the wound is sweet. If the secretion does not diminish quickly, the joint should be washed out again, but the tube should not be left longer than ten days, for fear of irritation of the cartilages. In

¹ Gaz. des Hôpital, May 18, 1878.

chronic cases, however, the tube may be allowed to remain for twenty to thirty days. The number of cases reported as treated in this way is six. No evil result took place in any of the cases, and the recovery is said to have been complete. Where there is caries of the bone present, it is the opinion of Scriber that excision offers the readiest method of treatment.

Heinecke,¹ however, reports two unusual cases, where the joints were incised antiseptically, and a sequestrum and disease of the tibia were found; the sequestrum was removed; the diseased bone was chiselled out and scraped away. Recovery with some motion ensued in both cases. Heinecke cites, as examples of the advantage gained from the use of antiseptic precautions, ten cases of affection of the knee-joint treated in the Magdeburg Hospital, where the knee-joint was incised and washed out. In all but two the joint was opened under spray. In two, the opening was caused by a wound, but the joint was washed out with antiseptic solutions, and treated antiseptically. In seven cases the result was cure, with the establishment of perfect motion. In three suppurative knee-joints (two, the above-mentioned joint affections complicated with necrosis of the tibia) there was only limited motion on recovery. Of the seven entirely successful cases, one was an acute serous inflammation, one hydrops articuli fibrinosus, one sanguineous effusion, three were punctured wounds of the knee-joint, one was the removal of a loose cartilage from the joint.

Schuller reports² two cases of antiseptic incision and drainage of the knee-joint, one in a case of chronic synovitis with sero-purulent exudation. Recovery followed, but details are not given. A second case was one of acute suppurative inflammation of the knee-joint following an attack of erysipelas. The patient died in fourteen days.

Rinne³ reports eleven cases of knee-joint affection tapped with a trocar, and washed out with a 3 per cent. solution of carbolic acid. Of these eleven, in five there was no reaction after the surgical interference; in four there was slight fever, and a temporary return of the fluid. Nine are reported to have been completely cured, apparently with recovery of motion at the

¹ Deutsche Zeitschrift für Chirurgie, 1878, 10th Bd. p. 296.

² Deutsche Med. Woch., November 24, 1877.

³ Centralblatt für Chirurgie, December 8, 1877.

joint; one died of tuberculosis; one was improved, but was unable to walk without the help of a stick.

One fact will readily be admitted: that experts in antiseptic surgery are much more bold, and claim better results than other surgeons. Ranke's statistics, read before the General Congress of Surgeons,¹ show unusually good results, which are attributed by the writer to antiseptic treatment. Out of seventeen cases of open wounds of the larger joints, fourteen recovered, with motion at the joints, both in cases where there was injury to the bone and where there was none. In the three which recovered with ankylosis, the patients did not come under treatment until after suppuration had become established. In no case did death follow.

Schüller, in his report of the surgical clinic at Greifswald, gives the results of twenty cases of knee-joint affections treated by Hüeter's method of injection (with a subcutaneous syringe) of a solution of carbolic acid (two to three per cent.). The injection is made either into the thickened capsule, or into the granulations on the extremities of the bones forming the joint. It is reported to have been particularly useful in serous and sero-fibrinous effusions. In such cases, more was gained in days and weeks by the injection than by months of other treatment. Of the twenty cases of knee-joint disease treated in this way (five serous and sero-fibrinous synovitis, two hydrops articuli, two chronic arthritis, eleven fungous synovitis), improvement is noted in all of the cases, except two; of these, one died of erysipelas, following the prick of the needle, and the other underwent excision. The method is not considered applicable in purulent synovitis.

Thus it will be seen that many of the leading European surgeons are much more bold in the treatment of diseases of the knee-joint than are those of our own country.

The clinical histories of fifty-three cases, reported by twenty-two surgeons, which are incorporated into this paper, added to my own, make sixty-three cases; sixty-eight joints aspirated, in all, one hundred and eighteen times, the quantity of fluid varying from one-half ounce to eight or more ounces. The character of the fluid was serous, sero-purulent, and sero-sanguineous. The causation in one case was syphilitic, in two cases septic, in three

¹ Ibid., Bd. 29, p. 480, 1878.

gonorrhœal, in four chronic inflammatory, in eight rheumatic, in ten acute inflammatory, in twenty-three traumatic, and in eleven not specified. In my own cases, the quantity of fluid varied from one and a half to six and a half ounces; specific gravity from 1012 to 1040. The average quantity was about four ounces, and the average duration of treatment was four weeks. Nearly all the cases are reported as excellent in result, with perfect use of limb; two or three as fair or improved; and only one death is reported, in which suppurative inflammation followed.

As will be seen by a careful study of the cases given, the conditions under which surgeons have feared to operate are those very ones where the most brilliant and satisfactory results have been obtained, namely, in acute inflammatory and traumatic cases. This is contrary to the advice of nearly all writers whom I have read; and yet, when we reflect upon the conditions present, we should expect, *a priori*, that this would be the series most benefited, and that temporizing would result most disastrously. Time is not allowed me to enter into a careful discussion of this important question.

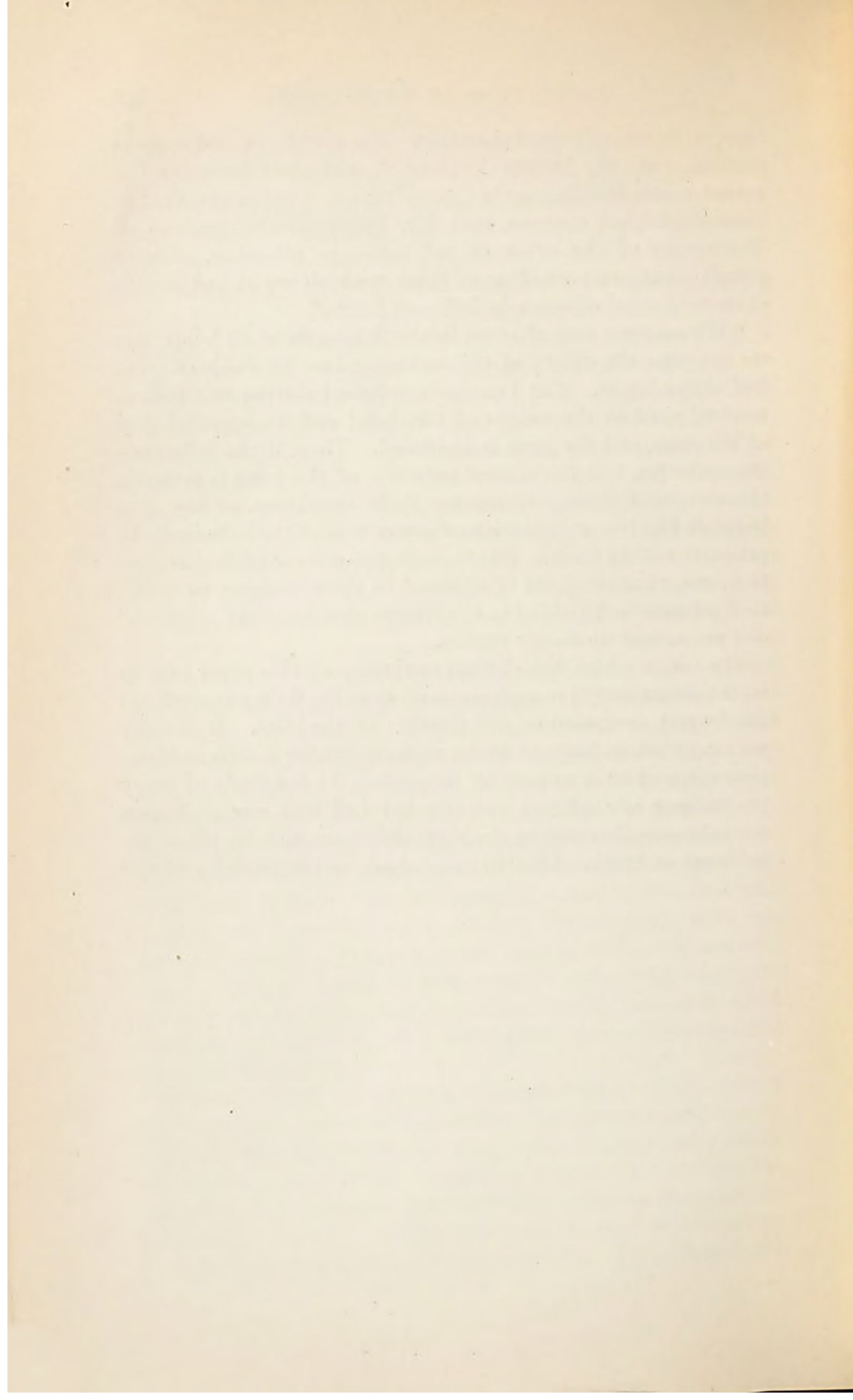
It is well known that the differences between the synovial and serous membranes are not very great. The innermost layer of the synovial membrane is completely invested with nucleated cells. Over extensive portions of the membrane, in silver preparations, two series of tracings are detected. The upper layer corresponds quite closely with the outlines of the endothelium. The underlying layer shows the characteristic vascular network, with long rhomboidal and square meshes, the serous canaliculi being intermediate. Böhm claims to have shown that the bloodvessels open into, and actually communicate with the serous canaliculi. Hüeter asserted that he had never observed such conditions, except in inflammation, when the tension of the sub-synovial lymph-paths was considerably increased; while Landzert, by employing his silver method, brings the lymphatics here into distinct view.

It is not difficult to picture the histological changes which are produced in acute inflammation. The serous exudation, the capillary injection, the venous stasis, are the first factors which, unrelieved, rapidly go on to produce pathological results that have long been known to the profession as among the most disastrous in surgery. Under the pressure and inflammatory changes, softening of the synovial membrane may, and probably

in most instances does, take place. The cartilages and osseous structures readily become implicated, and their integrity impaired, while the ligaments themselves are so often involved in these disastrous changes, that Mr. Paget selects them as an illustration of the effect of inflammatory softening, such as permits that great yielding of them "which we almost always observe in cases of severely inflamed joints."

"We may see such changes in the ligaments of all joints, but we examine the effects of this softening best in diseased knee- and elbow-joints. The ligaments, softened during the inflammation, yield to the weight of the distal and unsupported part of the limb, and the joint is disturbed. Then, if the inflammation subsides, and the normal nutrition of the joint is restored, the elongated ligaments recover their toughness, or are even indurated by the organization or contraction of the inflammatory products within them. But they do not recover their due position, and thus the joint is stiffened in the distortion to which its ligaments had yielded in the former period of inflammation," and permanent disability results.

The lesson which the clinical testimony of this paper teaches is, to operate early ; re-aspirate as often as the fluid accumulates ; aid by rest, compression, and fixation of the joint. If thereby we can avoid, in large measure, such deplorable results as above pictured, and such as present themselves to the study of every practitioner of medicine, may we not feel that our profession has taken another step in the right direction, and, by the establishment of truth, added in some share to the Divinity of our Art ?



A NEW INSTRUMENT FOR ADMINISTERING ANÆSTHETICS.

By A. M. POLLOCK, M.D.,
PITTSBURG, PA.

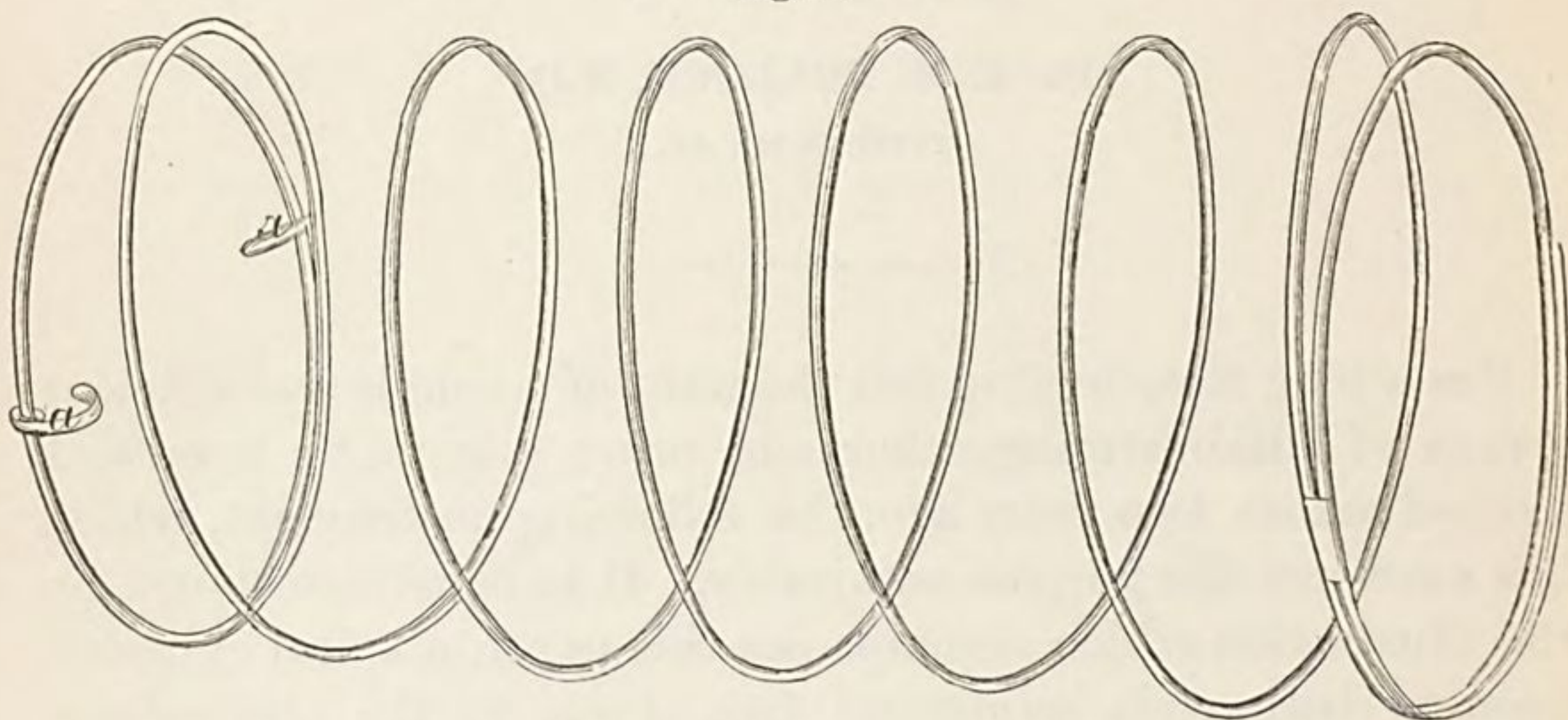
For a long time having felt the want of a simple and efficient means of administering ether and other anæsthetic agents, I devised, about two years ago, the following instrument, which has answered the purpose admirably. It is, as will be shown by the illustration which accompanies this paper, a spiral cylinder, open at both ends, admitting free access to the atmosphere, thereby causing less choking and strangling when the ether is first inhaled, and in no way interfering with its anæsthetic action. Ether vapor, being about four times as heavy as atmospheric air, gravitates towards the mouth of the patient, and there is, consequently, no waste of material.

From considerable experience and careful observation I am convinced that anæsthesia with sulphuric ether will be more rapidly accomplished and with a less amount of ether by using the open-end cylinder than by any other method whereby it is less freely commingled with the atmosphere. This probably depends, in a great measure, on the fact that the subject does not resist the vapor, but inhales with ease and comfort. At first I used a stiff towel rolled into a cylinder of the proper size and covered with paper, but found it unsuitable for a prolonged operation or when the patient was unmanageable from excitement, as in either case it was liable to be broken down and thus prevent free ingress of air along with the vapor. One point to which I desire to call special attention is the frame for the cloth and paper cylinder, which may, for hospital use, be made of two brass rings four inches in diameter, connected by three or four wires eight or nine inches long, around which a towel folded to the proper width may be rolled and this again enveloped in

paper to prevent outward evaporation, and the whole secured with two or three pins. One end of the cylinder is to be placed over the mouth and nose and the anæsthetic sprinkled in from the distal end, so that there may be no interruption in the process of administration.

The instrument (Fig. 1) I present for inspection is a coil or

Fig. 1.

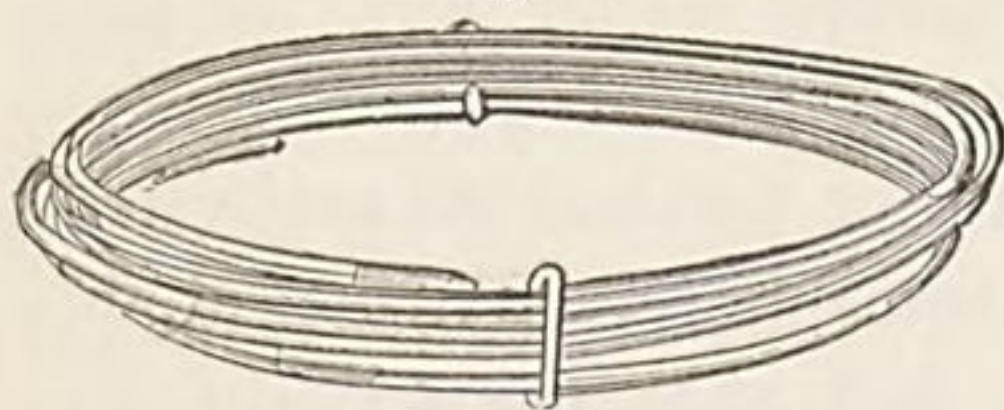


SPIRAL CYLINDER REDUCED ONE-HALF. *a, a.* Hooks to retain cylinder in position when compressed.

spiral of brass wire $8\frac{1}{2}$ inches long by 4 inches in diameter, which is to be enveloped with towel and paper as above described, and to be used precisely in the same manner. In this

shape the cylinder is conveniently portable; as you will see, when compressed (Fig. 2), it becomes simply a ring, and may be carried in the vest pocket.

Fig. 2.



CYLINDER COMPRESSED.

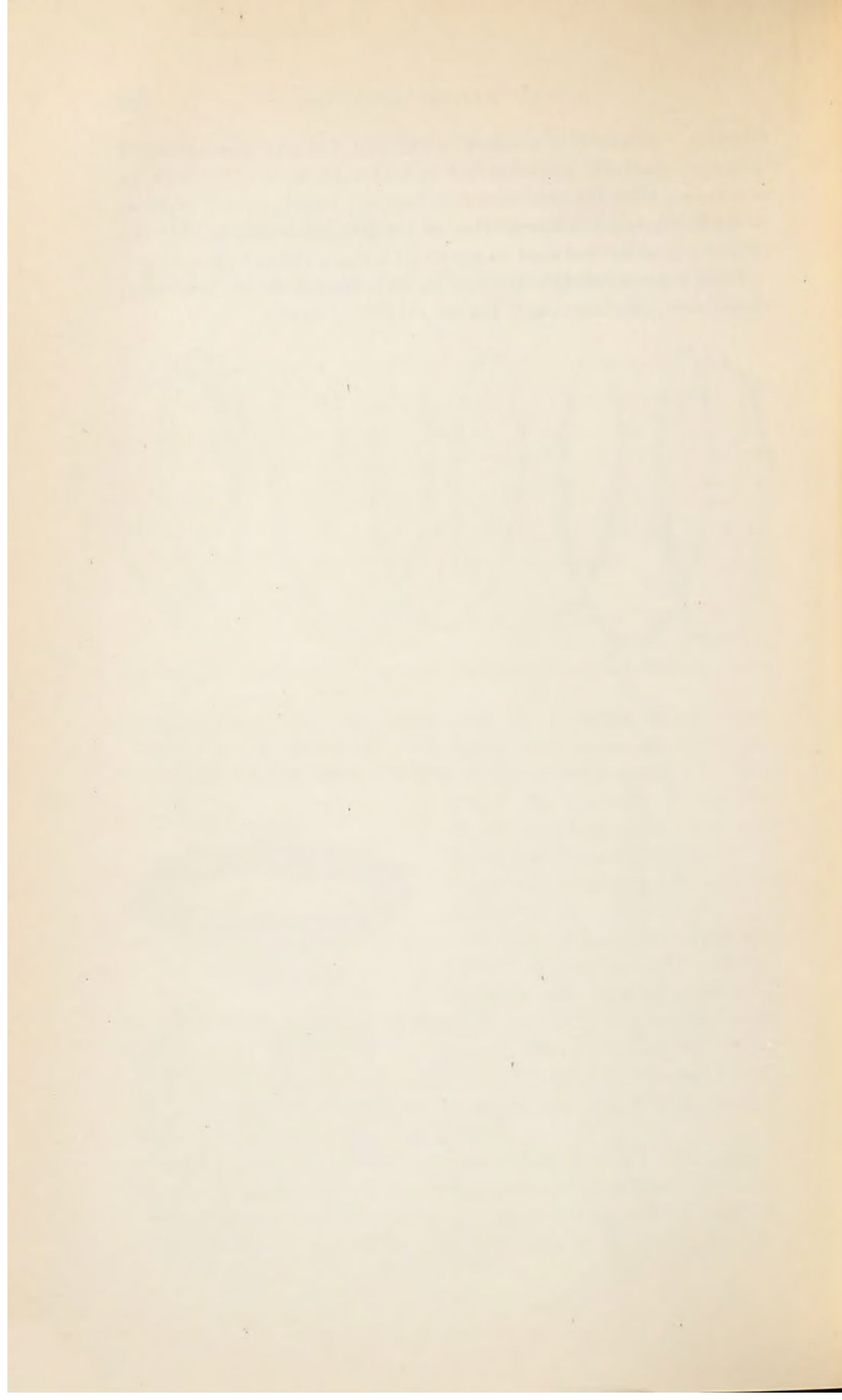
It may be suggested that Dr. Allis's apparatus will answer equally well the requirements

for administering ether satisfactorily; and this will be admitted, except as to the trouble in replacing the cloth bandage after using the instrument, and unless this be done it becomes filthy, and even more serious objections might be urged in regard to the danger of communicating disease.

In the use of the cylinder all that is required is a clean towel and a newspaper, and in a moment you are furnished with an unobjectionable appliance with which a strong, robust patient can be rendered insensible with two ounces of ether in five

minutes. While this method is suitable for any anæsthetic, it is more especially intended for the administration of ether, as it will overcome the objection so commonly urged, that it requires so much time and so much ether to produce insensibility that the operator is often induced to resort to a more dangerous agent.

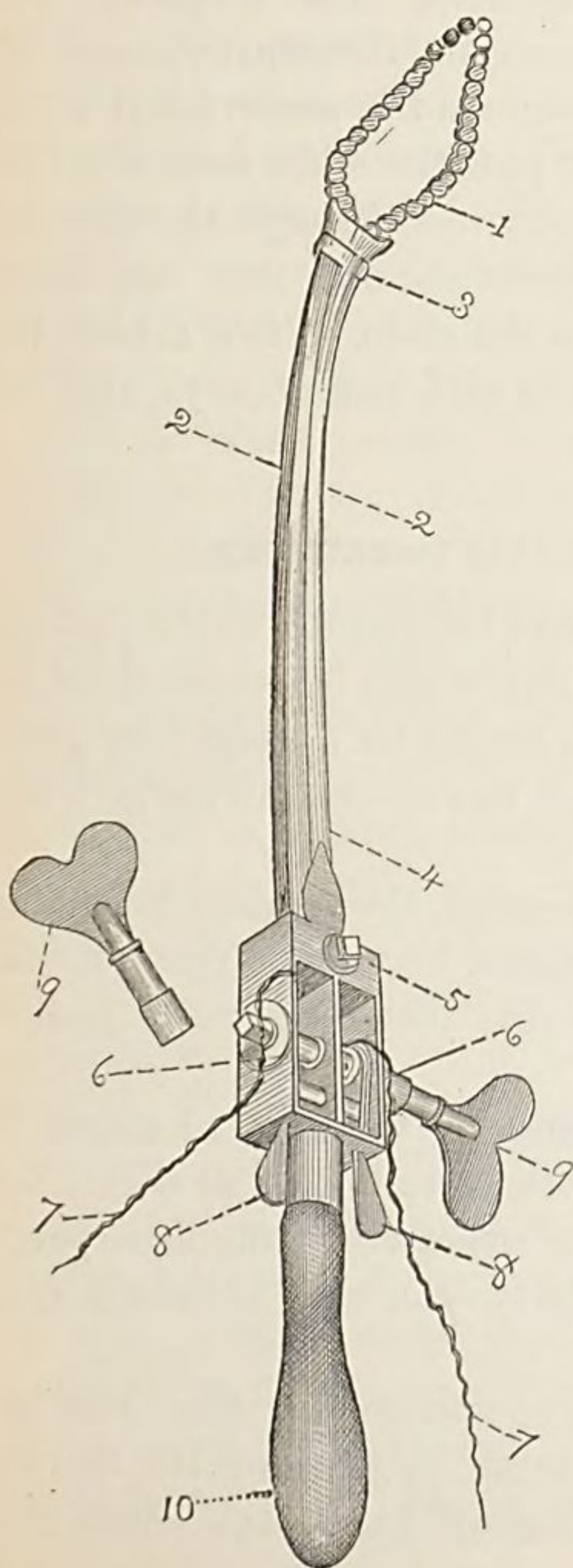
I feel warranted in claiming for this simple device economy, cleanliness, efficiency, and the maximum of safety.



ECRASEUR FOR THE REMOVAL OF UTERINE TUMORS.

By WM. SCOTT, M.D.,
WOODSTOCK, ONTARIO, CANADA.

THE difficulty I have found in adjusting the more commonly used *écraseurs*, and particularly in removing the *porte-chaine* while preserving the relations of the *écraseur* to the tumor, led me to the invention of the instrument presented, the idea being par-



1. The chain, which is sufficiently long to encircle the pedicle, and to which the wires Nos. 7, 7, are attached.¹

2, 2. The canulæ, which present a curve at the upper end, flattened on the insides at the lower end, and gauged to show when properly adjusted.²

3. The slide, to firmly bind the canulæ together when operating.

4. The rod, attached to slide to adjust and fix it firmly in position.

5. Screw, to attach the canulæ to the body of the instrument.

6, 6. Drums and ratchets on which the wires are attached and wound.

7, 7. Ends of wire (unattached to drum in illustration), which connect the chain with the drum.

8, 8. Thumb-springs, by which the chain may be instantly loosened if required during the operation.

9, 9. Thumb-keys, by which the drums are turned and force applied.

10. Handle.

¹ The chain used should be one giving free motion in every direction, not flat as in cut.

² The upper end of canulæ should be well rounded on the inside, to prevent cutting of the chain.

tially suggested by Gooch's double canula. The accompanying illustration represents the instrument.

MODE OF APPLICATION.

Loosen screw No. 5 and withdraw both canulæ, chain, and wires. Reverse the canulæ, placing the two outer surfaces together, so that the points will be touching and the chain entirely within the canulæ; then pass both canulæ, guided by the finger, over the tumor up to the attachment of the pedicle; pass one of the canulæ to an assistant with directions to play out the chain as required, press the tumor to one side and carry the other canula carefully around one-half of the pedicle, then giving this to the assistant, you pass the chain in like manner on the opposite side with the canula he held at first. The insides of the canulæ will now be together, as seen in illustration, and by means of the gauge-marks it may be readily ascertained when perfect apposition is secured. Now pass the slide over the canulæ, but not pressing it home, pass the wires through the opening into the body, and the lower ends of canulæ into the same, tighten screw No. 5, and force home the slide. Now attach the wires to the drums, tighten the chain with thumb-keys, and the instrument is ready for operation.

ADVANTAGES CLAIMED FOR THIS INSTRUMENT.

- a. The ease with which the chain can be adapted to the pedicle.
- b. The certainty with which the chain can be retained in position when once properly adjusted, owing to no separate *porte-chaine* being used, which is very apt in removal to disturb the position of the chain.
- c. With the *écraseurs* in use at present, the pedicle is usually cut obliquely downwards and outwards, leaving a portion still attached to the uterus, while with this instrument the pedicle is severed equally throughout.
- d. If you wish to remove the tumor by pressure alone, as in ordinary *écraseurs*, you will turn both thumb-keys at once; but should the pedicle be cartilaginous or otherwise difficult to sever, by turning the thumb-keys alternately you may obtain a saw-like or cutting motion.
- e. If during operation you have reason to fear that you are trenching on the substance of the uterus, by pressing the thumb-springs Nos. 8, 8, you may immediately loosen the chain and readjust it.

CASE OF COMPOUND FRACTURE OF TIBIA AND FIBULA.

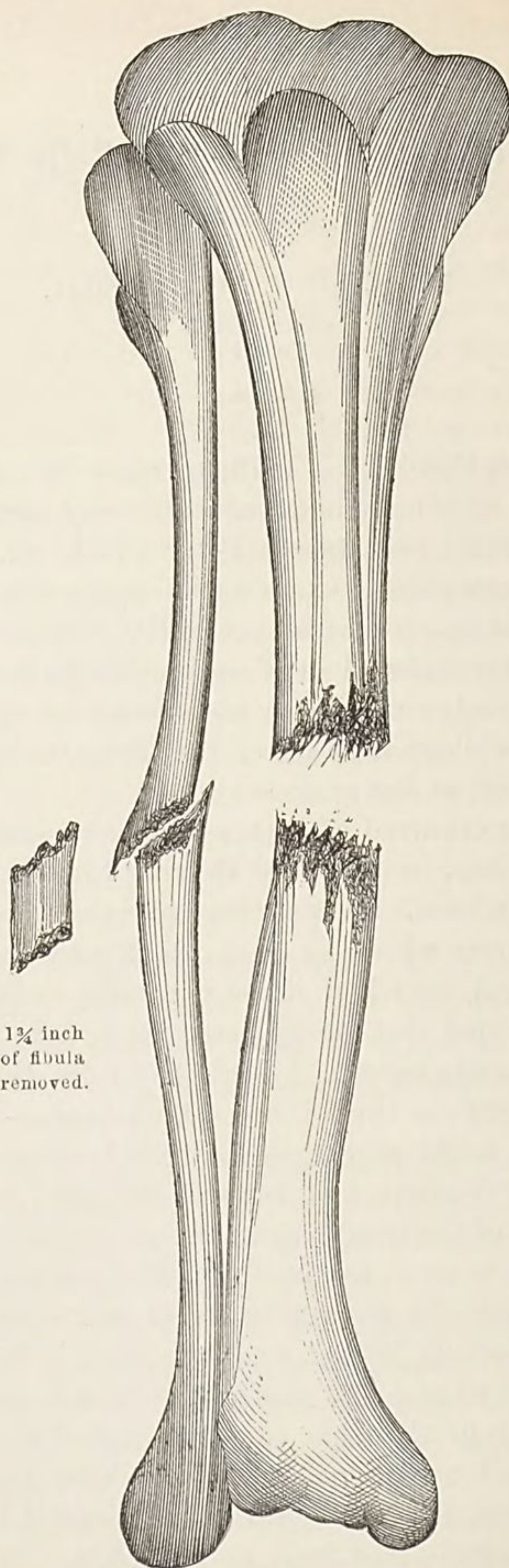
By ISAAC N. QUIMBY, M.D.,
JERSEY CITY, N. J.

I WAS called, October 13, 1876, to meet in consultation two surgeons (one of whom had been an army surgeon of two or three years' experience), to see Peter Finck, æt. eighteen, who, as I found after a careful examination under ether, had received a compound comminuted fracture of the tibia, a little below the middle, with a complete loss of an inch and a half of the entire shaft, and extensive contusion and laceration of the soft parts. There was an oblique fracture of the fibula, on a line with that of the tibia, *with no loss of its substance*.

The accident occurred while the patient was driving a heavily laden truck, when, in the act of shifting himself, he slipped and fell under the wheels. It is perhaps proper to state at this point that the surgeons who were first called, previous to my seeing the patient, and who had made a careful examination under ether, had decided *that the leg could not be saved*, and therefore recommended amputation. I dissented from this decision, and proceeded to perform the following operation:—

The patient being etherized, I directed my assistant to take hold of the limb above and below the injury, and to bend the leg at the seat of the wound at an obtuse or nearly a right angle, so as to expose to view, as much as possible, the ends of the fragments. Finding the remaining lower and upper fragments of the tibia very sharp, jagged, and irregular, as shown in Fig. 1, I enlarged the wound and dissected the soft parts away from the broken ends of the tibia to a sufficient degree to enable me to apply a small metacarpal saw and remove the sharp jagged ends of the fragments. When this was done it left a deficiency of one and three-fourths inch of the tibia. Then I carefully worked my way through the wound to the lower fragment of

Fig 1.

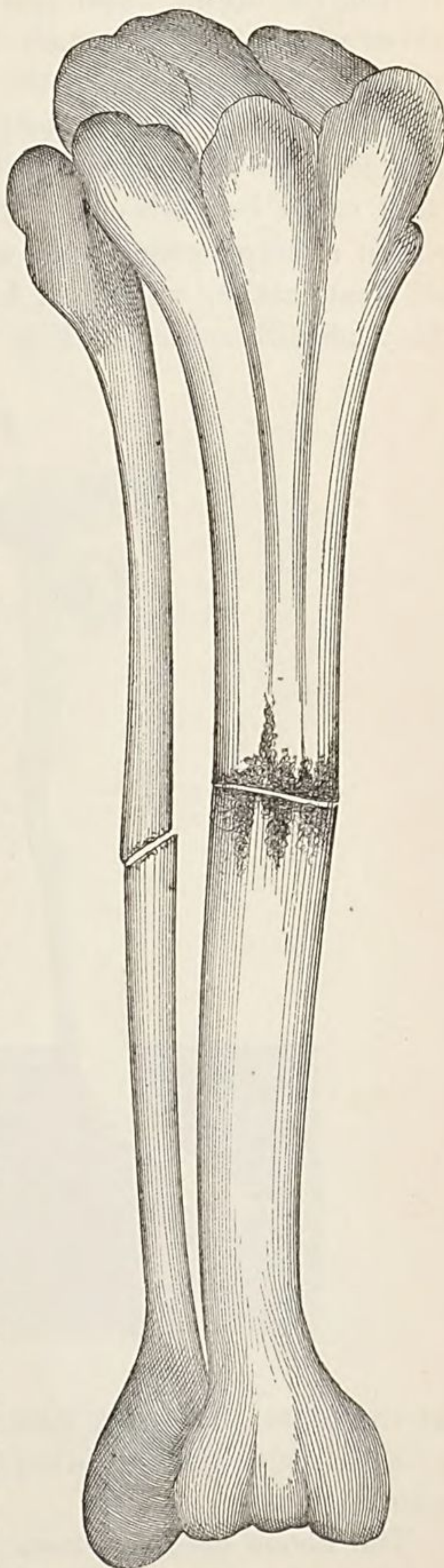


Compound Comminuted Fracture of the Tibia and Fibula, with loss of one and three-quarters inch of shaft of tibia. Condition and appearance of bones before operation.

the fibula. Dissecting the soft parts away from the end of the bone, and seizing the end thus exposed with a pair of lion-tooth forceps, I gave these to my assistant, who held the bone firmly while I sawed off one and three-fourths inch of the fibula, so that it should correspond in length with the tibia. This being done and the wound cleansed, I adjusted the upper and lower ends of the bones quite accurately in apposition, as shown in Fig. 2. In consequence of the shortening of the bones there was an apparent superfluity of the soft parts, rendering somewhat difficult the dressing of the wound, and leading to a delay of two days in applying an apparatus for the proper support of the bones. At the end of that time I placed the limb in an ordinary fracture-box, the sides of which were provided with hinges, and used bran for padding. In this way the fragments were supported in a *fixed position* by the aid of adhesive plasters and bandages. This treatment was kept up for about seven weeks, the wound being covered meanwhile with a solution of carbolic acid in water, half an ounce of acid to a pint of water.

For the first three weeks there was quite a large discharge of purulent matter. The discharge of matter became less and less profuse as the process of healing went on, until at the end of eight or nine weeks it had almost entirely ceased. At this time there seemed a pretty firm union of the frag-

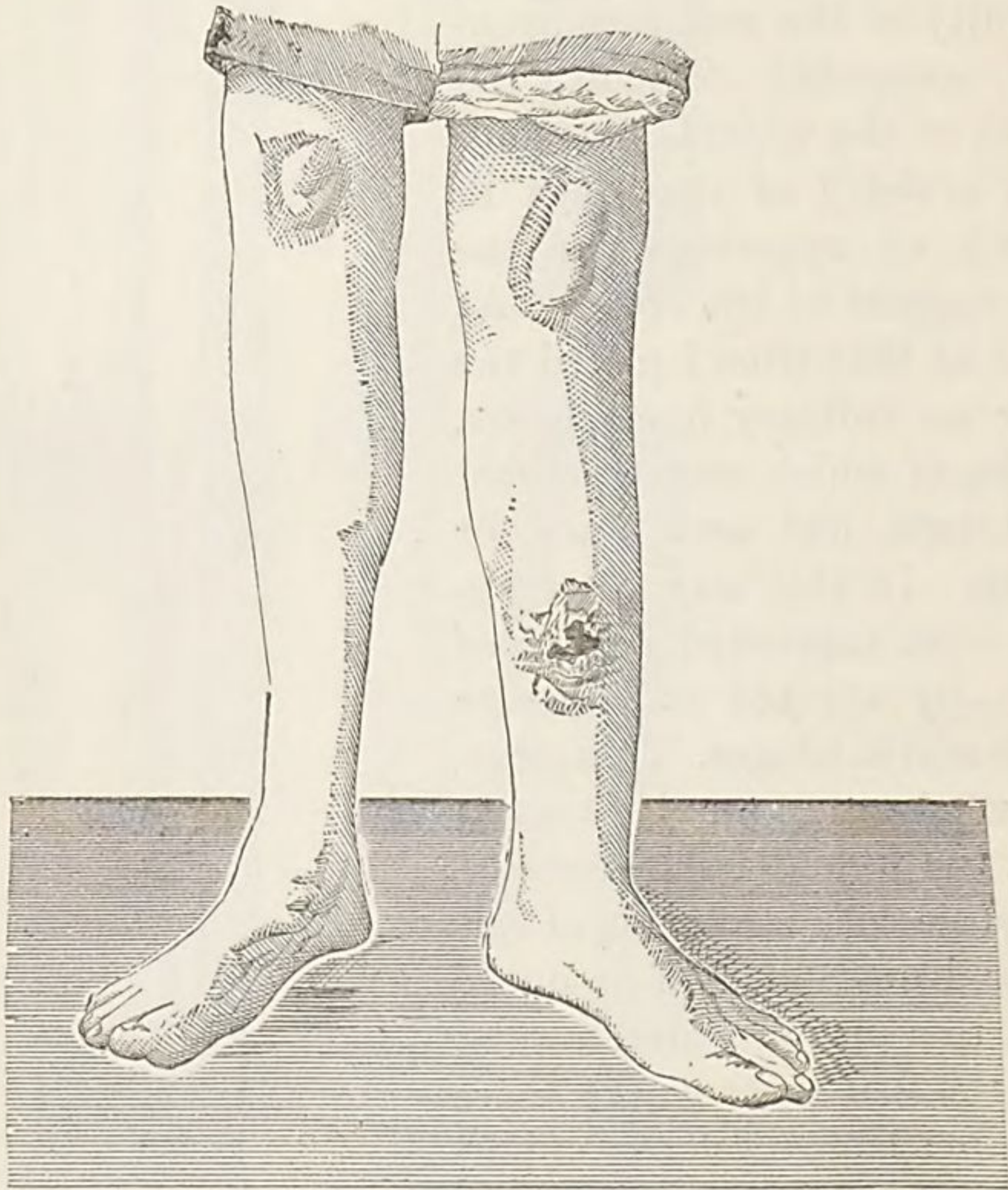
Fig. 2.



Condition and appearance of the bones after the operation.

ments. The limb was now taken out of the box and thoroughly cleaned, and the plaster-of-Paris bandage applied, with a fenestra opposite the wound, so as to allow the escape of any discharge that might occur. The plaster bandage was kept on for about three weeks, and the man allowed to go about on crutches, meanwhile bearing a little weight upon the limb. At the expiration of this time the plaster bandage was removed and a simple roller bandage applied. At the end of three months, the man could bear his entire weight upon the limb, and with the aid of a simple cane, could walk about quite well. The process of cicatrization was slow, but was completed on the 24th of May, as will be seen in Fig. 3, drawn from a photograph taken

Fig. 3.



at that date, the young man walking about at that time as well as usual, with the exception that there was a slight limp in his gait.

The above case has been shown to Profs. Post, Sayre, and

Crosby, and other eminent surgeons, all of whom pronounced it a valuable example of conservative surgery, and worthy of the attention of the profession. It appears probable to me that an operation analogous to that above described may occasionally be useful in compound and comminuted fractures of the forearm as well as of the leg, in equalizing the length of the two parallel bones, when they have been unequally shortened in consequence of the injury to which they have been subjected.

CICATRICAL CONTRACTION FROM BURNS: DEFORMITY OF FACE AND OF BOTH HANDS: REPARATIVE OPERATIONS.

By ALFRED C. POST, M.D., LL.D.,

NEW YORK.

J. W., born at Cutchogue, L. I., Dec. 25, 1876. On the 27th October, 1877, he fell over with a high chair to which he was tied. His face fell on the upper rim of a hot stove: the backs of both hands were brought into contact with the side of the stove, the commissure which joins the thumb and index finger of the right hand embracing a projecting bar of iron: the back of the left hand was burned much more severely than that of the right. Cicatrization was complete in about three months. Before the healing of the sores a number of pieces of bone were discharged from the left hand.

Nov. 6, 1878. The present condition of the child is as follows: General health good: mental and bodily development beyond the average: the right angle of the mouth is rounded, thickened, and indurated: a cicatricial ridge extends from the right commissure of the lips to the front of the chin, and obliquely upward and outward to the lobe of the ear, varying in breadth in different parts from half an inch to an inch.

Right Hand.—The thumb at its distal joint is acutely flexed and immovably bound down to the palm of the hand by very dense cicatricial tissue. There is complete luxation at this articulation. The distal phalanx of the index finger is subluxated outward at an angle of about 45° , and is quite immovable. The index and middle fingers are webbed together on their dorsal surfaces from the commissure to the articulation between the first and second phalanges. The web does not involve the palmar surface. There is free motion of all the articulations of the fingers, with the exception of the distal articulation of the index finger.

Left Hand.—The thumb and ring finger are substantially free from deformity, and enjoy perfect motion. The ring finger is slightly drawn back by a cicatricial band, which, however, does not interfere with its movements. The little finger is drawn obliquely backward and outward to an extreme degree by a dense mass of cicatricial tissue. The distal phalanx is slightly flexed, and there is a little perceptible motion. The index and middle fingers are much distorted, drawn backward, and immovably fixed. The index is dwarfed and thrown behind the medius. The distal end of the medius is bent backward. A very thick, hard cicatricial mass, in which the index, middle, and little fingers are imbedded, occupies half of the dorsal surface of the hand, which is drawn back on the forearm.

I began the treatment to-day (Nov. 6th), with an attempt to improve the condition of the right hand. I made a longitudinal incision on the dorsal surface of the index finger about three-fifths of an inch in length, extending over the distal extremity of the second phalanx and the proximal extremity of the third phalanx, dividing the skin, the extensor tendon, and the periosteum. I then carefully separated the periosteum from the bone, and with Liston's bone-forceps divided the bone of the second phalanx a quarter of an inch from its extremity, and removed the end of the bone. I also excised the cicatricial band by the contraction of which the end of the finger had been distorted. After this I was able to draw the end of the finger into its normal position; but it required some effort to hold it there. I then dissected up a triangular flap from the palm of the hand, the base of the triangle towards the articulation of the first phalanx of the thumb with the corresponding metacarpal bone, the apex towards the little finger, dividing the cicatricial mass on each side, but the thumb remained fixed, or was liberated to a very slight degree. I then excised the distal end of the first phalanx of the thumb in the same way in which I had operated on the index finger, and about to the same extent, after which I was able to bring the terminal phalanx of the thumb into a nearly straight position. I divided the web connecting the index and middle fingers, up to the commissure.

After waiting for the oozing of blood to cease, I brought together with sutures the wounds on the back of the index and of the thumb, and a part of the wound in the palm of the hand. I then applied a felt splint adapted to the dorsal surface

of the forearm, hand, thumb, and fingers, securing the different parts to the splint with adhesive strips and a bandage. The wound had previously been thoroughly washed with carbolic acid, 1 to 40. The distal end of the index was not as fully adducted as I had desired, nor was that of the thumb as fully extended, but there was a very marked improvement in the position of these parts.

7th. I found the patient in a very good condition, bright and playful. The dressings did not seem to have been in any degree disturbed or loosened.

The wound was dressed on the 8th and 10th, and afterwards daily, washing the parts freely at each dressing with carbolic acid, 1 to 40.

27th. The wounds have made favorable progress. Nitrate of silver has been applied to exuberant granulations as often as necessary. Passive motion has also been made from time to time. There has been an improvement in the position of the thumb and finger. The wounds are nearly healed. The interdigital space between the index and middle fingers has been maintained, as far as possible, by crowding strips of adhesive plaster up to the commissure during the healing process.

December 5th. The wounds are entirely healed. The interdigital space is not as perfect as immediately after the operation. The thumb is in a good position, but its motions are limited. The terminal phalanx of the index finger is nearly in a perfect position. The child is to go home into the country for a week or two. I gave directions to support the index with a splint in a straight position, and to apply passive motion freely to the thumb to increase its mobility.

19th. Patient has returned from the country in a good condition. To-day I performed the following operation on the left hand. I made a longitudinal incision on the dorsal aspect of the index finger, exposing the remains of the phalanges, and removing them, preserving the soft parts as a covering for the middle finger. I excised the principal part of the thickened and indurated cicatricial tissue which bound the middle finger to the back of the hand, and then brought the middle finger forward into a moderately flexed position. As a large portion of the dorsal surface was destitute of integument, I covered it in part with the skin removed from the index, securing it in place with fine sutures. I also divided the dense cicatricial

bands confining the little finger in its abnormal position, and brought it into a state of moderate flexion. A considerable denuded surface was left on the back of the hand, and on the dorsal surface of the little finger, to heal by granulation and cicatrization. As the first phalanx of the middle finger was bent backward, the second phalanx forward, and the last phalanx backward, and immovably fixed in that position, I excised the distal extremity of the second phalanx, and was thus enabled to bring the part into a better position. I secured the palmar surface of the forearm and hand to a stiffened felt splint, with digital prolongations for the middle, ring, and little fingers, which were secured to the splint in a moderately bent position. The middle and little fingers could not be brought into perfect shape, and much was necessarily left to be accomplished by subsequent treatment.

25th. For several days past, I have applied caustic potassa to the raw surface of the inodular tissue covering the dorsal aspect of the first phalanx of the little finger, reducing the thickness of the indurated mass. To-day I removed the sutures connecting the flap taken from the index finger with the dorsal portion of the middle finger. The flap retains its vitality throughout, and is adherent to the subjacent parts at the proximal extremity, but not at the distal end. The exposed surface on the back of the hand is granulating, and presents a healthy appearance. The dressings are renewed daily, the parts are freely washed with the carbolic lotion, and passive motion is applied.

January 20, 1879. The application of caustic potassa was continued only a few days after the last report, but a slight application of nitrate of silver was made daily until three days ago, since which time it has not been required. For the last fortnight, the three fingers of the left hand have been drawn together with adhesive plasters, and have been secured to a bent splint by adhesive plasters and bandages. The dorsal surface of the little finger is entirely covered with integument, and that of the middle finger nearly so. The granulating surface on the back of the hand is greatly reduced in size, and presents a healthy appearance. I determined to-day to leave the parts undisturbed for forty-eight hours, intending hereafter to dress the wound at intervals of two days.

February 13th. The wound is entirely healed. The little finger is in an extended position, but can be flexed to a moderate

degree at the metacarpo-phalangeal articulation, and very slightly at the other articulations. The middle finger is shorter than the ring finger, and nearly double its breadth. Its distal phalanx is bent outward toward the thumb. Near the distal extremity, there is a slight separation between it and the integument transplanted from the index. To-day I performed the following operation: I exposed the terminal phalanx of the middle finger by an incision on its dorsal surface, and divided it with bone forceps, removing more than a quarter of an inch of its proximal extremity. I also removed a longitudinal strip of integument from the dorsal surface of the finger, about a quarter of an inch in breadth, including the edges of the cleft near the extremity of the finger. The edges of the incisions, after being washed with the carbolic lotion, were then brought together with sutures. I then dissected up a triangular flap of integument from the dorsal surface of the forearm near the wrist, the base of the flap extending on each side of the cicatrix on the back of the hand, the apex about three and a half inches upon the forearm. Bending the hand upon the forearm, the apex of the flap was drawn down about two inches, and the sides of the chasm thus produced were united transversely by pin sutures. The sides of the flap were then united with the outer edges of the wound by pin and thread sutures, fortified by strips of adhesive plaster, and the forearm and hand were secured by their palmar surface to a bent splint. The object of the triangular flap was to diminish the tendency to subsequent retraction of the hand backward on the forearm.

After completing the operation, as above described, on the left hand, I performed an operation on the right hand, to give more liberty of motion to the thumb in a backward and outward direction. Finding that it was attached to the palm of the hand by a broad and thick band of cicatricial tissue, which prevented full extension and abduction, I divided this band by four parallel incisions extending through its whole thickness. Cloths wet with a carbolic lotion were then applied, and kept in place by a bandage, reserving the use of a splint for a subsequent dressing.

14th. I applied a felt splint to the dorsal surface of the forearm and hand, fixing the thumb in an extended and abducted position. I also dressed the left hand, finding the wounds in a satisfactory condition.

15th. Removed all the pin and thread sutures from the left forearm and hand. The edges of the wound on the forearm from which the flap had been taken remained in contact, and were secured by adhesive strips. The edges of the flap receded a little, but were kept in place by strips of adhesive plaster. There was a little suppuration, but the general appearance of the parts involved in the operation was favorable.

28th. The wounds at the junction of the right thumb with the palm of the hand are entirely healed. I deem it expedient to keep the parts still on the stretch. The wound on the middle finger of the left hand is healed. Its extremity is still bent outwards, and is fixed in that position. The wound on the back of the hand is nearly healed, and there is considerable liberty of motion at the wrist-joint.

March 10th. The wounds are all healed.

21st. The patient being etherized, I performed the following operations:—

I. I dissected out an additional portion of the superfluous integument on the outer side of the middle finger of the left hand. I then incised the periosteum over the second phalanx, and with cutting forceps removed an additional portion of that bone, overcoming the curvature of the end of the finger, which I secured to a splint in a straight position.

II. I divided the web uniting the upper part of the space between the first phalanx of the index and the first phalanx of the medius of the right hand. I divided this web nearer to the middle finger than to the index, and, to gain additional space, dissected a triangular flap with its base extending on each side of the web, and its apex extending up on the dorsum of the hand. I was able then to bring the edges of the integument together with sutures on the ulnar side of the index. Strips of adhesive plaster were also applied around the index, and others around the medius from the commissure downward.

III. I dissected out a cicatricial band on the face, which drew downward the right angle of the mouth; and I then elevated the right extremity of the vermilion border of the lower lip, and secured it by a pin suture to a raw surface prepared for it at the junction of the right extremity of the upper lip with the cheek. The vacant space thus left below the right angle of the mouth was closed by a horizontal flap dissected from the

lower lip a little below the vermilion border and attached to the adjacent parts with fine sutures.

23d. I dressed all the wounds of the hands and face, removing all the sutures excepting those immediately below the vermilion border of the lip. These were so imbedded in dried blood that I could not remove them without disturbing the process of adhesion. Union has taken place, except at one point below the angle of the mouth. I applied over the wound of the face a number of linen threads moistened with collodion. The wounds of the hands were dressed with adhesive plasters and bandages.

25th. The wound of the face has not been disturbed since the collodion was applied, day before yesterday. The wounds of the hands were dressed yesterday and to-day; they were doing well, except that on the dorsal surface of the left hand there has been sloughing of the old cicatrix near the lower extremity of the metacarpal bone of the middle finger, over a space of about half an inch in diameter. This has perhaps been due to the pressure of a felt splint. To-day I left off the splint, securing the middle finger by adhesive strips to the ring finger.

27th. The collodion dressings on the face, having become loose, were removed; the remaining sutures also were taken out. The wound on the face was supported by strips of India-rubber adhesive plaster.

April 17th. The wounds made at the last operation have all healed. The middle finger of the left hand is much reduced in size; it is somewhat shorter than the little finger, and it is nearly straight. The space between the index and middle finger of the right hand is restored, there being scarcely a trace of the web which united them. The deformity of the right angle of the mouth is almost entirely overcome. But the vermilion border of the lower lip in that vicinity is thicker than toward the opposite commissure. To relieve this deformity I dissected out a wedge-shaped portion of the vermilion border and united the edges of the wound with three fine sutures. The right thumb also being still bound with cicatricial bands so as to prevent it from being freely abducted and extended, I divided these bands by three parallel incisions, and secured the thumb to a splint in a position of forced abduction and extension. The splint was applied to the radial edge of the forearm, and was bent so as to adapt it to the posterior and external surface of the

thumb. It was composed of two layers, felt next to the limb, malleable iron outside.

19th. I removed the splint from the right thumb, and found the wound in a good condition. Reapplied the splint as before.

21st. Removed the sutures from the lip. The wound has united, and the lip presents an improved appearance.

The results obtained from the treatment of the complicated deformities of the face and hands in this patient fall far short of a perfect restoration of the deformed parts to their normal shape. But considering the extent of the deformities, and the difficulties to be overcome, I regard the result as eminently satisfactory. The disfigurement of the face, which was moderate in degree, has been in a great measure removed. The right hand has been greatly improved in its shape by liberating the thumb from its imprisoned condition, by restoring the interdigital space between the index and middle fingers, and by greatly diminishing the extent of the abduction of the terminal phalanx of the index finger. A glance at the drawings showing the appearance of this hand before and after the treatment will suffice to show the improvement which has taken place.

But the principal triumph of surgery in the treatment of this case is exhibited in the change in the conformation of the left hand. Before the treatment, this hand presented an almost perfect thumb and ring finger, while the other parts entering into its structure were drawn into a confused and shapeless mass in which the three remaining fingers were blended together, so as to require a careful dissection to separate them from each other and from the mass of cicatricial tissue in which they were enveloped. The hand, as a whole, was drawn forcibly back upon the forearm, and firmly fixed in that position by the dense cicatricial mass in which the fingers were imbedded. As a result of the treatment, the hand is brought down to its proper position in the same plane as the forearm, and is capable of being flexed and extended by the voluntary action of the muscles. The little finger occupies its proper place by the side of the ring finger in an extended position, but its motions are as yet quite limited. There is reason to hope that by the persevering use of passive motion there may be a considerable improvement in the degree of mobility. The middle finger is greatly reduced in length, but occupies its proper place on the radial side of the ring finger. The thumb and ring finger retain their perfect form and mo-

bility, as before the commencement of the treatment. The hand is very far from being perfect, the index finger having been removed, and the middle finger much shortened, but the remaining parts of the hand are in their proper relations to each other, and the hand as a whole is far from presenting the shapeless and unsightly mass which it did before the treatment.

The following wood-cuts will assist the reader in obtaining a correct idea of the character of the deformities, of some of the steps in the operations which were performed, and of the degree in which the several deformities were relieved by the treatment.

Fig. 1.



Fig. 1 is copied from a photograph, representing the deformity about the right angle of the mouth. Fig. 2 is copied from a photograph exhibiting the same parts after the treatment.

Fig. 3 is copied from a drawing, exhibiting the palmar aspect of the right hand before treatment. An unsuccessful attempt had been made to secure a photograph of this hand before the operation. Fig. 4 is copied from a drawing representing the dorsal aspect of the same hand before the operation of March 21st, 1879, exhibiting the web which joined the index and middle fingers, and the triangular flap which was cut on the dorsum

Fig. 2.



Fig. 3.

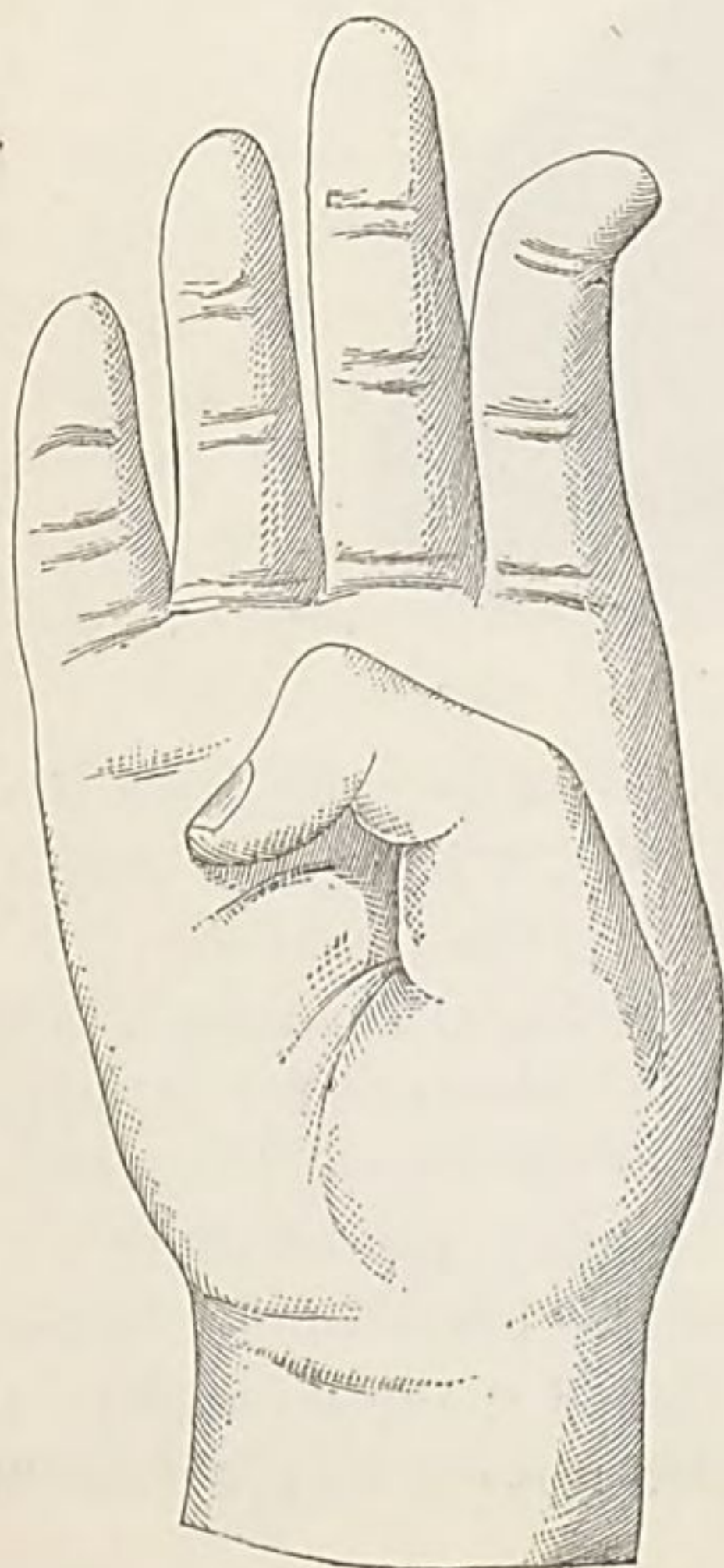
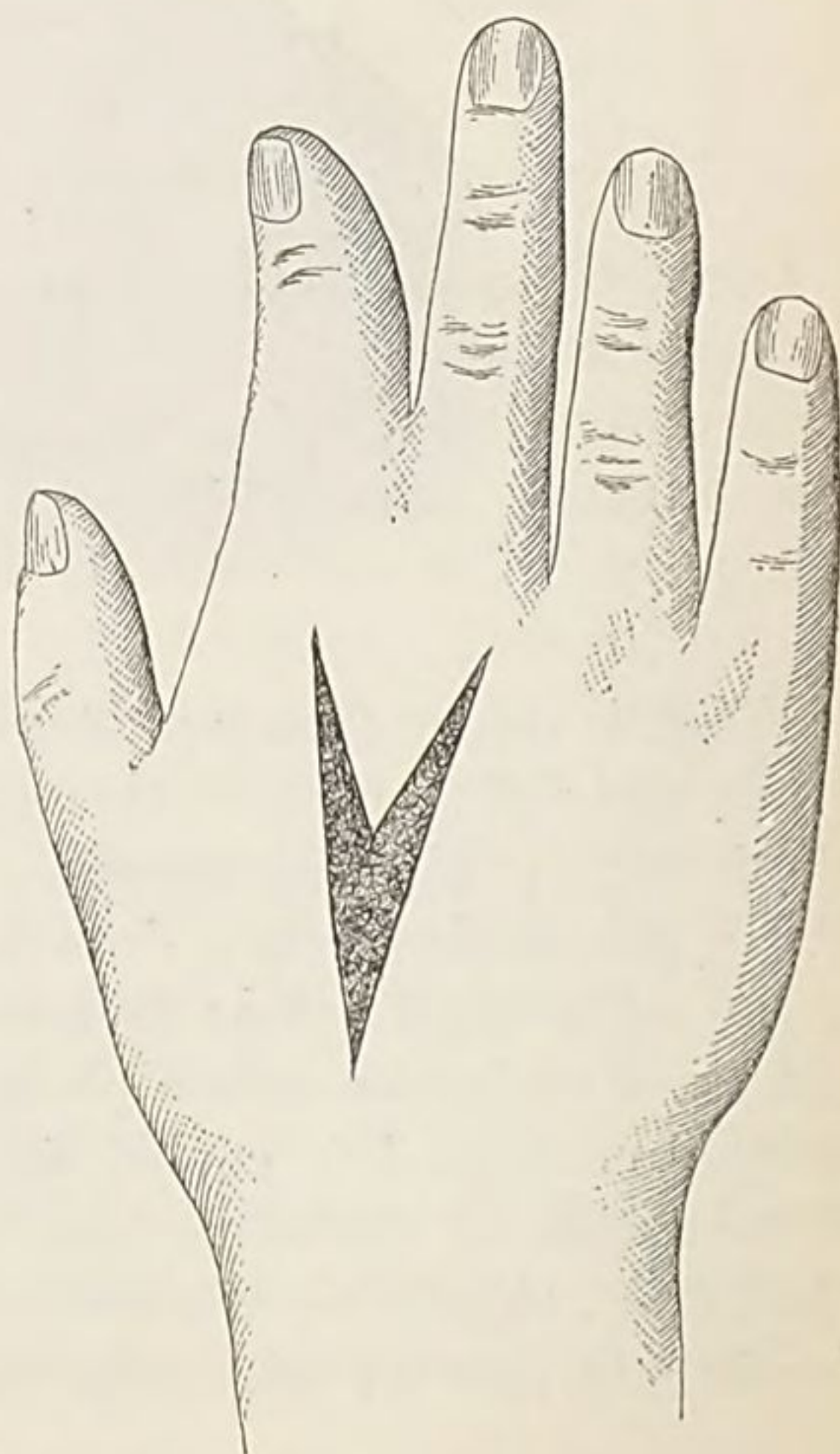


Fig. 4.



of the hand to diminish the tension of the parts in that region, so as to facilitate the healing of the integument on the opposed sides of the fingers, after the division of the web.

Fig. 5 is copied from a photograph exhibiting the appearance of a plaster cast of the palmar aspect of the right hand at the close of the treatment.

Fig. 5.

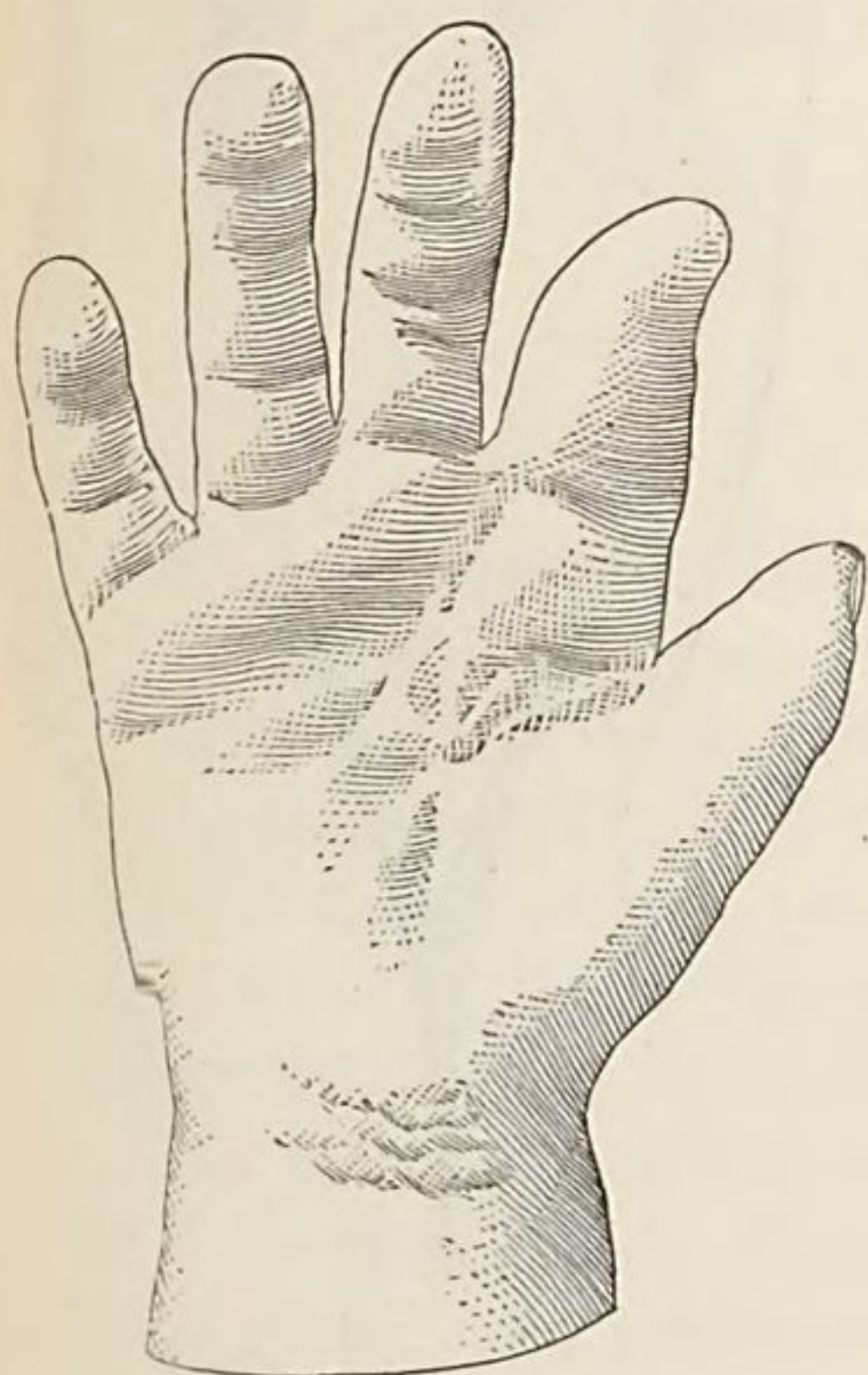


Fig. 6.

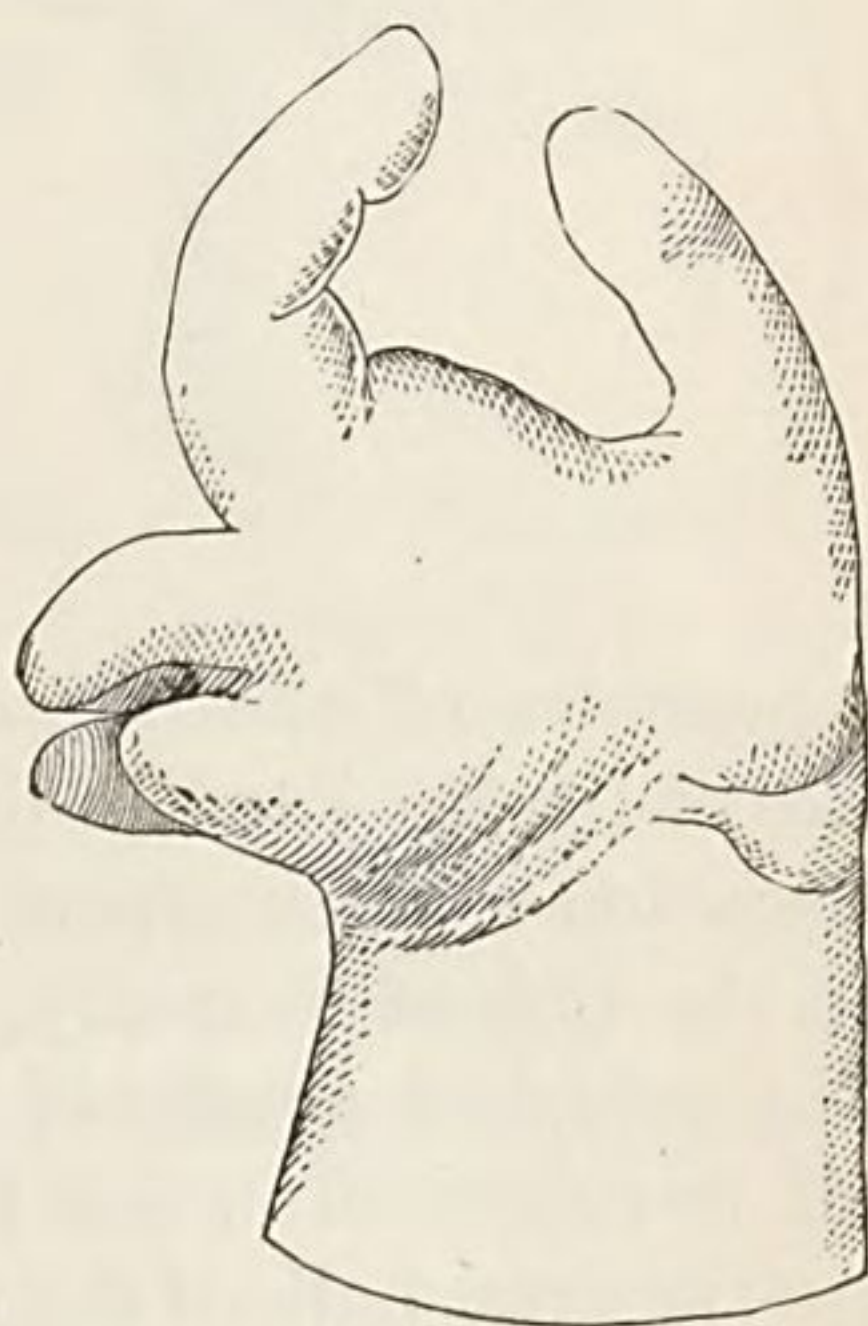


Fig. 6 is copied from a photograph exhibiting the appearance of a plaster cast of the radial aspect of the left hand, in its deformed condition, before the treatment. The thumb and the ring finger are conspicuous at the upper part, and are free from deformity. The middle finger, shortened and curved, is placed behind the ring finger. The index finger is drawn upward and backward behind the middle finger, and beyond its terminal phalanx is seen the tip of the dorsal surface of the little finger. The hand, as a whole, is seen to be drawn forcibly upward and backward upon the forearm.

Fig. 7 represents the left hand as seen from its ulnar side. The little finger is seen deeply imbedded in cicatricial tissue, leaving only its distal extremity free. The middle finger is seen behind the ring finger, and between it and the little finger appears a small portion of the tip of the index finger.

Fig. 8 is copied from a drawing, giving a general idea of the

Fig. 7.



appearance of the dorsal surface of the left hand before the operation which was performed on the 13th of February, 1879. The principal objects of interest, as exhibited in this figure, are the great bulk of the reconstructed middle finger, and the triangular flap which was dissected from the dorsal surface of the forearm and hand to relieve the tension in that region, and to give greater freedom of motion to the wrist.

Fig. 9 is copied from a photograph of a cast representing the dorsal aspect of the left hand at the close of the treatment. The apparent distortion of the thumb is the result of the struggles of the child while the cast was being taken. The thumb itself is entirely free from deformity, and its mobility is unimpaired.

Fig. 8.

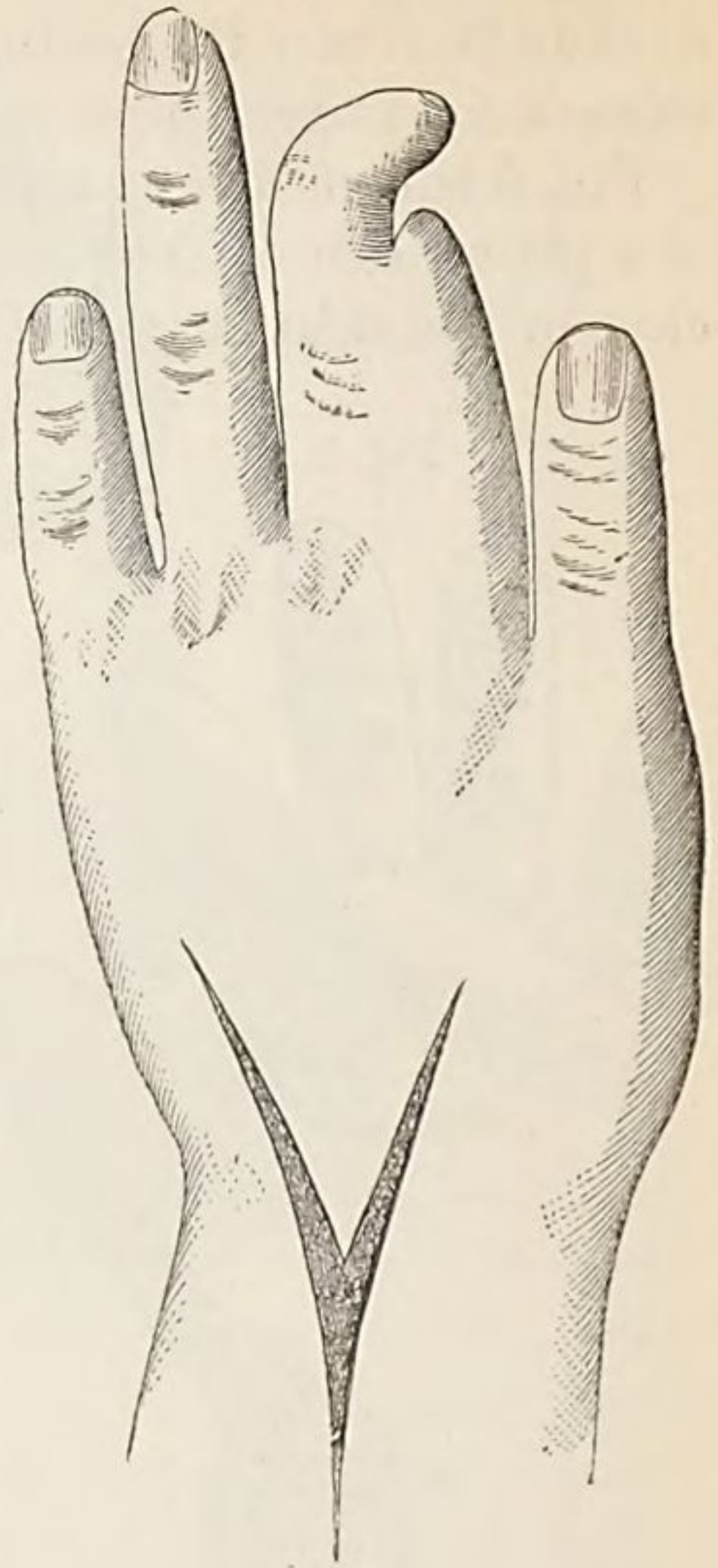
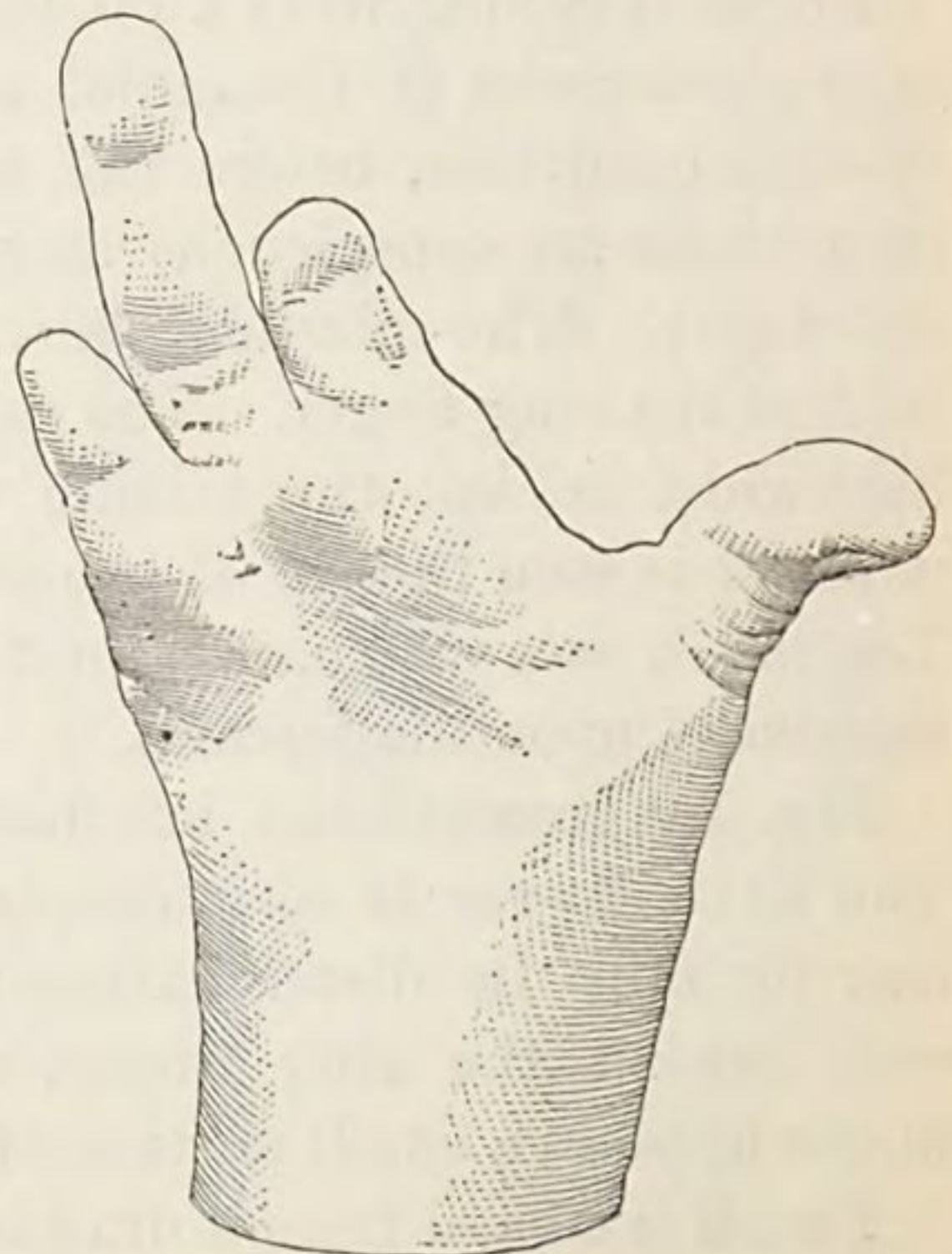


Fig. 9.



A NEW METHOD OF REDUCING DISLOCATION OF THE ELBOW-JOINT, WITH THREE CASES ILLUSTRATING ITS SUPERIORITY OVER THAT USUALLY RESORTED TO, OF SIR A COOPER.

By E. B. TURNIPSEED, M.D.,

COLUMBIA, S. C.

THE most common dislocation of this joint is that in which both bones of the forearm are thrown backward with or without fracture of the coronoid process. This injury is readily recognized, except in corpulent persons, by the projection backwards of the olecranon, carrying with it the tendon of the triceps. Should these present, however, any difficulty in the diagnosis for want of the above evidences, the shortening of the forearm will settle all doubts.

The forearm is bent slightly on the arm; my method will be briefly given: The patient standing erect with arm outstretched, an aid standing behind the patient seizes him with both of his arms around the body immediately under the armpits; the surgeon, standing on the outside of the arm, with his right hand (if the injury is that of the right elbow) grasps the wrist, and with left hand grasps the humerus just above the condyles, with the thumb firmly fixed on the olecranon; then he uses extension and counter-extension, pressing with great force the olecranon forward and inward, and then suddenly straightening the forearm upon the arm; and the surety of success is so unerring that it is seldom necessary to make a second effort. I have successfully reduced this dislocation by this method without using any anæsthetic, and the pain was comparatively so little and so soon over that it was difficult to convince my patient in one instance that the reduction was completed.

I first resorted to this means in the case of a negro boy about sixteen years old, who, in attempting to bridle a mule in an open lot, and failing, attempted to strike the animal with the

reins, holding on to the top of the headstall and bringing it around with full force and right arm outstretched; instead of striking the mule, the rein caught in the fence and dislocated the elbow-joint by the succussion. I found a portion of the external condyle of the humerus fractured, and the joint dislocated; reduction was made as above directed, and although there was partial ankylosis, the adhesions were broken loose, and the boy had perfect use of the arm. This was in 1876.

The next case was in a white boy twelve years of age, Frank H., who was thrown from a mule, dislocating the right elbow-joint; reduction was effected as above directed.

The third case was Major M., from Charleston, S. C., who, on the 13th of November, 1877, was thrown or fell in attempting to get off his horse opposite the Columbia Hotel, in Columbia, S. C., during a large military parade, dislocating the right elbow-joint. When I reached his room I found Dr. Atkinson, Assistant Surgeon 18th Infantry U. S. A., with him, who kindly assisted me, and is a witness to the facts in the main as related in this paper.

The process is simply extension, counter-extension, and by virtue of the force exerted on the olecranon as well as the straightening of arm, the condyles of the humerus are lifted over the coronoid process. Cooper's method tears the ligaments and soft parts generally, and causes far too much pain both during and after the operation; for, instead of lifting the condyles of humerus, they are caused to rake closely and with great force the anterior surfaces of ulna and radius, and the jumping over the coronoid process must be terrific for the patient without an anæsthetic.

A NEW APPARATUS FOR TREATING FRACTURE OF THE CLAVICLE; WITH TWO SUCCESSFUL CASES.

By E. B. TURNIPSEED, M.D.,

COLUMBIA, S. C.

THIS apparatus consists of two pieces of leather about two and one half inches in width ; one about six and one half, and the other about four and one half inches in length, the upper ends sloped and sewed together, and the lower ends connected together by a cord of leather half an inch in diameter and covered with best chamois, the length being about four and one half inches. At the top or first described union of these broad pieces of leather there is attached a leather strap half an inch wide and sufficiently long, with the strap on opposite side (there being one for each arm) to buckle over the shoulders. At the lower ends of the longest broad pieces which pass in front of each arm are attached other leather straps. These straps are intended to regulate the tension of the apparatus. Thus we have the means of retaining the shoulders in a position that will adjust and secure the fractured ends of the bone in position; thereby obtaining an advantage over the old figure-of-8 method, because, in that there is no way to regulate the tension, and the stretching of the material usually employed makes it difficult to get union without deformity. Dr. Sayre's method must interfere with the breathing; and also the very stout plaster used is evidently uncomfortable to the patient.

The first case in which I used this apparatus was that of Mr. R. A. P., of Richland County, S. C., a young white man about twenty-three years of age, who presented himself at my office on the 25th of July, 1875, with a fracture of the right clavicle about its centre. I left the apparatus on three or four weeks, during most of which time he superintended farm work: the union was excellent.

The next case was a Mr. Z., a farmer about thirty-five years of age, of Richland County, S. C., who had his right clavicle fractured about the point of junction of the outer and middle thirds of the bone. I left the apparatus on three or four weeks, and the result was a good solid union.

URINARY CALCULUS.

By HENRY FRASER CAMPBELL, M.D.,

AUGUSTA, GA.

PART I.

THE SURGERY, THERAPEUTICS, AND HYGIENE OF URINARY CALCULUS.

Lithotomy in Children—In Adults—Study of the Nuclei of Calculus—Rate of Calculous Precipitation—"Constitutional Solvents"—Traumatic Calculi of American Civil War—Bilateral Lithotomy and Virility—The Influence of Drinking-water in the Production of Stone—The "Water History" of Calculi—Lithotomy and other Methods in the Female.

BILATERAL LITHOTOMY—THIRTY-NINE OPERATIONS IN THE MALE.

THE origin of calculous formations in the bladder is so various, and the conditions attending their development so numerous, that no surgeon, however limited his experience, can begin the task of making his personal record without recognizing the difficulty and yet obvious convenience of some method of classification. Lecturers and systematic writers vary their arrangement according to methods deemed most advantageous for imparting instruction. Our own object at present has little in common with these. It is simply to furnish the more or less carefully observed facts pertaining to a number of our cases of calculus and of lithotomy operations, the notes of which we have been able to recover, sometimes imperfectly, from among the rather scattered records of the past thirty years. A number of operations have been necessarily excluded on account of lost or entirely deficient notes. Classification is herein scarcely attempted. We do not presume to instruct, but simply to relate.¹

¹ As during the course of the present report we will have occasion to refer often to calculi of various constituents, we append the following classification, based upon the chemical constituents of the several varieties, from the Article "Urinary Calculi," in the last edition of *Cooper's Surgical Dictionary*, 1872.

In all the male cases herein reported the bilateral operation of Dupuytren was adopted. Having used this method in the first few cases, and becoming more familiar with it in each succeeding operation, for this reason, more than any other at first, it soon became our invariable procedure in all male cases, whether infantile or aged, emaciated or robust. From personal experience in any other method we cannot argue the superiority of this one, as in nearly fifty cases, we have not, in a single instance, used any other operation than Dupuytren's. Bilateral lithotomy, like every other method, as is well known, has not been an invariably successful operation. From one cause or another, unnecessary to mention here, many fatal results have occurred even in the hands of some of its most able and distinguished advocates. Mr. Coulson,¹ who strongly favors this operation, gives the following results: "Dupuytren lost nine male patients out of thirty-eight. Of the forty-seven operations performed by Sanson, Roux, Blandin, and Velpeau, ten were fatal. Finally, of twenty-three operations performed by Professor Eve of the Nashville University, four terminated fatally. We have thus a mortality of one in four and two-thirds, for the bilateral method." In regard to hemorrhage particularly, he says, "Dupuytren himself, Sanson, and others, have lost patients from bleeding. There is the risk, if the blades [of the double lithotome caché] be too widely separated, that they may come in contact with the rami of the ischia as the instrument is being withdrawn and so divide *both* pubic arteries. This accident, we believe, happened to Dupuytren himself. With a narrow pubic arch, it is not unlikely to occur."

The order and frequency of the several varieties have been carefully established by Dr. Prout, from the examination of 823 calculi. This is the classification most frequently referred to in the present paper.

1st. Uric acid calculi; viz., the uric acid, the urate of ammonia, and the uric oxide calculus.

2d. Those arising out of the oxalic acid diathesis; viz., the oxalate of lime or "the mulberry calculus."

3d. Those of the phosphatic diathesis; of three kinds, viz., triple phosphate of ammonia and magnesia, the phosphate of lime and the mixed or fusible calculus.

4th. The carbonate of lime calculus.

5th. Cystic oxide calculus.

6th. Fibrinous and other pseudo-calculous substances deposited in the bladder.

¹ "When the stone is known to be of ample size, the bilateral operation, I think, merits the preference to all ordinary plans." Article, "Lithotomy." Vol. II., 1872. *Cooper's Surgical Dictionary*.

In the experience of a considerable number of operations with the double lithotome caché we have had a number of quite young children, from two and a half to eight years of age, with of course very contracted pubic arches. We are confident, that on one or two occasions, the blades in being withdrawn were unavoidably sprung against the rami of the pubis,—yet in none of these cases did we have to contend with any serious hemorrhage. A very different and perhaps a fatal result might have attended such an occurrence in the case of the adult male. Fortunately, the very contracted pelvic arches are to be found mostly in children. In these, the organs of generation are yet undeveloped and their main artery—the internal pudic—even should one or both be cut, would not probably yield a very serious amount of hemorrhage. To this circumstance, we have no doubt, is due our immunity from hemorrhage. In the adult male we have had two very considerable primary hemorrhages and two really alarming, though not fatal, secondary bleedings; but we are confident they proceeded from the artery of the bulb (except in one to be hereafter mentioned) caused by cutting a little too much forward in making the longitudinal incision to pass in the beak of the lithotome, and not from any injury to one or both of the internal pudics. The *tampon en chemise* packed with pledgets of cotton-wool well saturated with a solution of Monsel's salt, always promptly and permanently arrested the bleeding, as will be seen in the description of our cases of hemorrhage.

The majority of the cases we are about to give presented so many points of similarity to each other, and to ordinary cases of vesical calculus, that no particular discussion of them could add to their interest. On the other hand, the few cases in this catalogue which are marked by peculiar characteristics were so diverse and aberrant, that no general remarks can be made to apply in common to scarcely any two of them. Such considerations, therefore, as may grow out of the peculiarities of such cases, we have most reluctantly determined to intersperse among the recountals of the cases themselves.

BILATERAL LITHOTOMY IN CHILDREN—TWENTY-ONE CASES.

CASE I. H. J., a white boy, aged about four years. Residence in De Kalb County, Georgia, near Stone Mountain (primitive granite); in the care of Dr. J. L. Hamilton. This child had

suffered from very early infancy, was much emaciated, but otherwise in favorable condition for the operation. Bilateral operation; very little hemorrhage; oblong stone, $1\frac{1}{4}$ inch in length; a good specimen of the oxalate of lime, very hard and somewhat nodulated; a chalky deposit on one end. Recovery speedy and complete.

CASE II. W. J., a white boy, eight years of age, a brother of the last patient, also living in De Kalb County, Georgia, under identical circumstances of air, food, and water, as Case I.¹ Bilateral operation, near Stone Mountain, assisted by Dr. Hamilton. Stone not analyzed, but entirely different in structure, color, and appearance from that of the brother; friable and chalky; weight seven drachms. This child had been in uninterrupted distress for many days, and had not slept for several nights. He fell asleep almost before the operation was completed. Dr. Hamilton reported that he slept nearly twenty-four hours. He recovered rapidly without any bad symptom.

CASE III. J. L., white child, under three years of age. Residence, Augusta, Georgia. Bilateral operation, July 23, 1855, assisted by Dr. Robert Campbell. Stone single, size of an almond; not analyzed nor weighed; probably triple phosphate. Recovery.

CASE IV. L. R., white child, aged three years. Residence, Hamburg, S. C., opposite Augusta, Ga.; healthy otherwise. Case kindly referred to me by Prof. L. D. Ford, of this city, who was present at the operation. Bilateral lithotomy, January 3, 1857, assisted by Drs. L. D. Ford and Robert Campbell. Stone white and friable; oblong; weight half an ounce; not analyzed. Recovery very rapid. "The child could not be kept in bed," and had stolen out of the room and was found playing in the yard on the fourth day after the operation; of course the wound had not healed. After the healing of the perineal wound, the power of retention was slightly impaired in this boy for a considerable time. He recovered, however, spontaneously.

Remarks.—Children, so to speak, "mind the operation" by the lithotome very little; most of our cases are difficult to control; they are disposed to play, to roll over and tumble about in the bed, just as soon as the smarting of the cut has ceased. The explanation we give for their good spirits is, that the relief by the removal of the stone causes them to forget the comparatively

¹ Stone Mountain, granite formation. No lime or magnesia in any water accessible to these patients.

trivial sore place in the perineum. We have never had a case of urinous infiltration to follow one of our operations, in either adult or child. We have never used a catheter or any other artificial "water way" in either the urethra or the wound, except where hemorrhage rendered packing with the tampon necessary.

CASE V. C. J., a white boy, aged two years. Residence, Augusta, Georgia. Bilateral lithotomy; a single brownish looking stone, round and slightly rough on the surface; not weighed nor tested; probably uric acid. Recovery.

CASE VI. Joe F., a colored boy, aged eight years, from Wilkes County, Ga. This case was referred to me for operation by Dr. J. B. Ficklen, of Washington, Ga., December 16, 1857. A small stone (about a drachm in weight) was lodged in the urethra, interrupting but not entirely preventing the passage of urine. This was removed by median incision. Pushing the sound on into the bladder, other calculi were found. The bilateral operation was at once performed, assisted by Dr. Ficklen and Dr. Robert Campbell. Two other calculi, both larger than that removed from the urethra, were removed. No test made; they were of reddish brown color, and their combined weight was about six drachms. Both wounds healed rapidly, and recovery was complete in the usual time. This boy had suffered with calculous symptoms for a considerable time; his bladder had been explored and the presence of stone detected by Dr. Ficklen, but he was brought to our hospital at that time on account of the recent lodgment of one of the stones in the neck of the bladder, the doctor fearing entire closure, as the stone resisted dislodgment back into the bladder.

CASE VII. William, a colored boy, aged twelve years, sent to our hospital by Dr. J. H. Pope, of Madison, Florida (limestone region). Bilateral lithotomy was performed in the ordinary way; stone not analyzed; weight somewhat over half an ounce. Recovery.

CASE VIII. Travis, a colored child, aged eight years. Residence, Madison, Morgan County, Ga.; "troubled in the bladder from infancy." Case referred to our hospital by our friend, Dr. G. B. Knight, of Madison, September 3, 1858. Bilateral operation; fawn-colored oblong stone, size of large pecan-nut; not weighed nor analyzed. Recovery rapid and complete.

CASE IX. Minor, a colored boy, aged ten years. Residence, Lexington, Oglethorpe County, Ga. Bilateral operation; a

light chalky looking stone; weight half an ounce and 21 grains; not analyzed. Recovery.

CASE X. Daniel Evans, a colored boy, aged six years. Sent to hospital from Brothersville, Richmond County, Ga., Nov. 15. Bilateral lithotomy Nov. 17, 1859. Discharged well Dec. 22, 1859. Stone light colored; weight about half an ounce; not analyzed.

CASE XI. Ben Fitz Patrick, a negro boy, aged about seventeen years. Residence, Warrenton, Warren County, Ga. He had "suffered from early childhood with his water." Bilateral operation performed at Jackson Street Hospital June 3, 1858. Profuse and exhausting hemorrhage, with great nausea, four hours after the operation. The hemorrhage resisted applications of ice, and we were preparing to apply the tampon, when it ceased suddenly and spontaneously on his vomiting a large mass of orange pulp which he had eaten clandestinely. There was no return of hemorrhage, and he made a good recovery; weight of stone nearly one ounce, white and friable; not tested.

CASE XII. John, a colored boy, aged six years. Residence, Richmond County, Georgia. Bilateral operation; two small white stones, weight estimated three drachms; not tested. Recovery.

CASE XIII. J. D., white boy, aged seven years. Residence, Augusta, Ga. Had suffered from vesical irritation from early infancy. Operation bilateral; single stone of fawn color, size of lima bean; not tested. Recovery in usual time.

CASE XIV. I. J., white boy, aged thirteen years. Residence near Marietta, Cobb County. Bilateral lithotomy; stone weighed half an ounce, of dark brownish color, probably uric acid. Recovery.

CASE XV. C. J., a white boy, aged about ten years. Residence, Augusta, Georgia. This case was in the hands of our esteemed friend, the late Dr. W. E. Dearing, who performed the operation, we consulting and assisting. Bilateral lithotomy; stone oblong, and of a chalky appearance; not tested; weight about six drachms. Recovery.¹

CASE XVI. D. S., white child, aged eleven years. Residence, Barnwell, S. C. This child had suffered from urinary difficulties for a long time; was pale and emaciated. Bilateral operation;

¹ This case is here reported, giving full credit, as we believe no presentation of it elsewhere has been made.

stone a white oval mass, one and a half by three-quarters of an inch; not weighed nor tested; probably phosphate of lime. Recovery.

CASE XVII. P. McC., a white boy, aged eight years. Residence, Augusta, Georgia. Bilateral operation; a small brownish stone, uric acid. Recovery.

In CASES XVIII. XIX. XX., the records are imperfect. We find them briefly noted among "white male children" on whom we have operated. They were all bilateral operations, and all recoveries. We have never employed any other method, and have had no death among children.

CASE XXI. Luke C. Willis, aged three years, from Wilkes County, Georgia. The child had given evidence of vesical irritation when about eleven months old. These symptoms had continued and increased to the present time. Patient pale, and somewhat emaciated; otherwise healthy and sprightly, when not in pain from the stone. August 3, 1878, bilateral lithotomy was performed in the ordinary way. Small uric acid calculus, 38 grains troy, was removed. Patient returned home in a week. Recovery complete, with no return of symptoms.

While in the opening paragraph of this report it was distinctly stated that no systematic method of classification would be attempted, it will be observed that all cases in which stone could be distinctly shown to have originated in infancy or in very early childhood, have been rather carefully grouped together. We fully believe, with several other writers on this subject, that a large proportion of those operated on in adult life have been the subjects of vesical calculus from early infancy, and that they should, in relation to the origin of the disease, be classed with infant cases. This early date of many of such cases is rendered more probable by the fact that, in a great many instances the size and weight of the stone seems to have an obvious reference to the time occupied in its formation, being somewhat commensurate with the age of the patient operated on. We have not had time, however, to consider each one of these cases in such a relation, and have grouped with children only those adult cases which we could clearly and distinctly make out as having been afflicted with calculous distress from the earliest periods of life. In the above grouping of our infant cases, and in the subsequent allocation of the adults, we wish here thus early to announce

the important object we have in view. It is that we may, by a careful study of them, in philosophic relation with various other facts and considerations, heretofore perhaps not often associated in such researches, if possible, arrive at some truthful and rational result, as to the origin, causes, and influence pertaining to the process of lithogenesis. Whether we have adopted the most advantageous method for utilizing these cases to this important end, we will not be able to decide till after the rather unusual and complex investigation has been completed. Some of the cases hereafter to be presented exhibit complications and peculiarities which give them much variety of interest. We shall endeavor, notwithstanding such irrelevant points of interest, to follow out persistently the main object of the present communication—the *Etiology, Rationale, and Progress of Lithogenesis*.

LITHOTOMY IN ADULTS—TWENTY CASES OF CALCULUS IN THE MALE.

Among the following adult cases, the notes of several will be found that have not been the subject of operation at all. They were cases, however, the course and progress of which we think will be regarded as well worthy of note, inasmuch as they present certain particular facts possessing a significant bearing upon the nature and treatment of calculous affections. Any peculiarities of the following cases deemed worthy of remark, will be discussed in connection with the notes, without perhaps any reference being made to them again.

CASE XXII. J. B. A., young man, white, aged twenty-one years, a resident of Floyd County, Georgia, had suffered from symptoms indicative of stone from childhood. Stone in bladder detected by Prof. H. V. M. Miller, who requested that we should operate. Bilateral operation performed at Rome, Georgia, April, 1852, assisted by Dr. Miller and Drs. R. C. and T. J. Word. Two uric acid calculi, of dark brown color, thickly studded with mulberry nodules; combined weight nearly one ounce. Case left in charge of Dr. Miller. Recovery complete, without any untoward symptoms.

CASE XXIII. Monroe, a mulatto man, aged about twenty-two years, was sent to Jackson Street Hospital from Madison, Morgan County, Georgia. Patient was well grown, healthy, and muscular. Bilateral lithotomy, assisted by Dr. Robert Campbell, Aug. 16, 1857; stone large and round, of a dark brown color,

probably uric acid; not tested; weight two ounces and forty-eight grains. Recovery rapid and complete. Virility, in this case, was seemingly unimpaired, as it was notorious among the nurses and patients then at the hospital that a woman in the yard had become pregnant by Monroe, previous to his discharge from the institution, and after the operation.

CASE XXIV. A young white man, aged about nineteen years. Residence, near Conyers, Rockdale County, Georgia. He was referred to the College clinic of operative surgery for treatment. Bilateral lithotomy was performed in the presence of the class, in which we were assisted by Drs. Geddings, Coleman, and Robert Eve. The stone was of a dark brown color, probably uric acid, of rather large size, and weighed one ounce and six drachms. No unusual incident attended either the operation or his rather easy recovery while in the city hospital, where he remained for two weeks previous to his return home.

CASE XXV. W. B. S., a white boy, aged eighteen years. Residence, Barnwell, S. C. He was emaciated and delicate, with a distressed expression of countenance; had suffered extremely from vesical trouble for some years. He said he was often "unable to pass water except in drops." The stone would often get into the neck of the bladder, and though it did not cause complete retention, would distress him for days. Careful examination detected a small rough stone near the *bas fond* of the bladder. Bilateral lithotomy was performed May 4, 1869. The calculus was very small, of a flattened cuboid shape, and of a whitish color, but extremely hard. It weighed over two drachms; horizontal dimensions, one-half inch by three-quarters of an inch; perpendicular, five eighths of an inch. The two broader surfaces were studded with hard and short mammillated projections, which rendered this stone, the one most calculated to grind and irritate the bladder of all the specimens, large and small, we have ever seen. It has not been analyzed; we have regarded it as composed of oxalate of lime. In contour and roughness of surface it is an exaggerated specimen of the mulberry variety. There was nothing worthy of remark connected with the operation. The patient progressed prosperously until the tenth day, May 14th. At this time, a secondary hemorrhage of the most alarming character took place, the blood passing both from the wound and from the urethra. Our friends, Drs. Edward Geddings and J. S. Coleman, both of this city, who had, with others, assisted me

in the operation, kindly visited the patient in my absence. All ordinary efforts, as applications of ice, etc., failed to arrest the bleeding. They very promptly proceeded to tear open the nearly closed perineal wound, and applied the *tampon en chemise*, after which only clear urine flowed through the tube. We allowed the tampon to remain about forty-eight hours. When it was removed, there were some evidences of suppuration, but we had no return of hemorrhage. The wound rapidly contracted and healed again. Notwithstanding the accident of hemorrhage, the patient made a rapid and complete recovery in the usual time. It is our opinion that the bleeding came from the artery of the bulb—and that this vessel was nicked at the time the longitudinal incision was made for the introduction of the beak of the lithotome. We are very sure that the blades were not set wide enough to wound either of the internal pudics.¹

CASE XXVI. John, a colored boy, aged seventeen years, sent to Jackson Street Hospital, Oct. 15th, 1853, by Messrs. D. and S., merchants of this city. Residence not noted. Bilateral lithotomy; oblong stone, weight about six drachms, white and chalky, triple phosphate probably. Recovery.

Of the following cases the records we have been able to recover are too imperfect to admit of their being applied to any purposes of induction, except as so many adult male cases in which bilateral lithotomy had been performed and had resulted successfully. We report them as white cases, since we have a full record of all our colored cases, amounting in all only to ten. The exact ages, residence of patients, time of operating, are points, the records of which have been lost. They were all operations previous to 1860. Having the specimens, we have weighed them. Time does not allow us to make of them any reliable test. In the table furnished Dr. Mastin for his report, these cases, we think, are set down as resident in Georgia.

CASE XXVII. White adult. Bilateral lithotomy; calculus white externally, flaked off apparently during operation by forceps, leaving a broad surface of reddish-brown and rough material; this layer is almost certainly uric acid; weight of stone 380 grains troy. Recovery.

CASE XXVIII. White adult. Bilateral lithotomy; calculus

¹ See note of Prof. F. L. Parker relating to retained virility in this case—Case XXXIX.

probably uric acid, but with white chalky deposits on a portion of its surface, not bisected but probably of alternating layers, somewhat oval in shape; weight one ounce and ninety grains troy. Recovery.

CASE XXIX. White adult. Bilateral lithotomy; calculi extracted—five irregularly-shaped white cuboid stones, the largest weighing 120 grains troy, the others much smaller—combined weight, 260 grains troy. The composition of these specimens is, we believe, of the triple phosphate variety, as they exactly resemble in color, shape, and texture, the large number from our other multiple case, O'Bannon, reported by Dr. Paul F. Eve, of Nashville, and also found (see Case XXXIX) in this list. Recovery.

CASE XXX. Adult white male. Bilateral lithotomy; stone oblong, white, chalky, weight 180 grains troy. Recovery.

CASE XXXI. Adult white male. Bilateral lithotomy; stone white, chalky; uric acid nucleus; broken part lost. Recovery.

CASE XXXII. J. B., white man, aged seventy-three years, a resident of Edgefield County, S. C. Our attendance was requested by Dr. Hugh A. Shaw, of Edgefield. We found Mr. B. extremely emaciated. He was worn down by irritative fever, and prolonged vesical distress, and loss of sleep. His appetite was gone, he ate almost nothing. All his symptoms seemed, at the time of this visit, to indicate that he would not survive the operation if then attempted. After consultation, we refused to operate, plainly stating to the patient our apprehension as to the result. He was advised to take bicarbonate of soda and other antacids freely. Quinine in both tonic and anti-periodic doses with iron was also given, but we did not encourage him to hope anything from an operation. We left him at that time, indeed, never expecting to see or hear of him again alive.

Two weeks subsequent to the above visit, to our great surprise, we received another note from Dr. Shaw, in which we were informed that "Mr. Bledzoe was still alive, that he thought himself much better, that he insisted on the operation being performed, as he could not sleep, and suffered interminable distress."

On this second visit, though finding the patient, so far as we could see, in no way any better, we somewhat regretted our refusal to operate, simply because he had shown more endurance

than had been suspected. We found it now impossible to resist his appeal, urgent and not altogether unmixed with accusations and reproaches. He urged that the operation would give him rest, and that in case he died, he would not, at his age, be deprived of many years. Though not fully assenting to the legitimacy of all his arguments, we determined that to operate was not altogether an unwarrantable procedure. Assisted by our friend Dr. J. S. Coleman and Dr. Shaw, we performed without difficulty the bilateral operation, the patient being under the influence of the anæsthetic mixture. Several dark stones the size of small marbles were removed; there were also removed some jagged angular pieces, probably fragments of another stone which had broken in the bladder. We think they were of uric acid. The operation was followed by decided relief; he slept well and his condition for some days allowed hopes of his recovery. His appetite and strength, however, did not improve. The vesical tenesmus again began to distress him; low fever set in, and he died on the ninth day after the operation. Whether his death was hastened or retarded by the operation we have not been able to decide.

CASE XXXIII. B. D., adult white man, aged about thirty-five years. Residence, Madison, Morgan County, Georgia. Had been the subject of calculus for many years. This case was kindly referred to us by Drs. A. A. Bell and A. C. Perry, of Madison, who had discovered the existence of stone, and wrote urgently requesting that we "should visit the patient prepared to perform lithotomy, which his condition seemed urgently to demand." This patient was of irregular habits, and subject to occasional prolonged attacks of *mania-à-potû*, from which he had previously recovered after protracted exhaustion. His present extreme condition was attendant upon one of these attacks. He was almost unconscious—in a state of muttering delirium. Sleep interrupted by constant vesical distress. The urine was scanty and purulent. After consultation with his two attending physicians, and with Dr. G. B. Knight and other gentlemen of Madison invited to conference in the case, we hesitatingly decided in favor of the operation as the only measure offering him the least chance of recovery. Assisted by these gentlemen, bilateral lithotomy was performed. Anæsthetics were not administered, as the condition of the patient seemed to render them hazardous, and also from the fact that in his semi-conscious state he was apparently insensible to the incisions as well as to the

introduction of the sounds and grooved staff. The stone is quite a large one, the size of a duck egg, of a dark reddish color; not tested, but probably of the uric acid composition. It weighed two ounces two drachms and twenty-one grains troy. There was considerable hemorrhage at first, but it was promptly arrested by the *tampon en chemise* before any exhaustion was manifested by the pulse. Leaving Madison a few hours after the operation, a letter from Dr. Perry informed me that Mr. D. did not recover from the low delirium in which the operation was performed; that there had been no return of hemorrhage, and that he died on the sixth day after the operation.

These last two cases are the only ones out of what we believe to have been a series of over fifty bilateral operations (for there are many specimens in our collection we have not pretended here to place on the list for want of notes) that have terminated fatally. We have seldom or never refused to operate, therefore this is not a report of selected cases. This last case (and indeed that preceding it) did not appear any less suitable for operation than several others that finally recovered.

THE NUCLEI OF CALCULOUS FORMATIONS.

Having in our collection a number of specimens which have been precipitated upon *nuclei* of rather unusual character, we here make their record the occasion to offer a few remarks upon this very essential element of every stone. Whatever may be the particular influences which underlie, and give rise to, any calculous deposit, the existence of a *nucleus* is the earliest event in the history of the accretion. Whatever may be the chemical constitution of the urine, or the particular *diathesis*; whether it be loaded with urates or phosphates, or with the oxalate of lime, it is, we think, very generally admitted, that until some more or less solid centre for accumulation is presented either from within or from without, the subject will continue to escape the calamity of stone. Finding no convenient *terms* by which to designate the two entirely distinct classes of vesical and renal *nuclei*, we ask for the exercise of some patience and deprecate severe criticism in humbly venturing to introduce the following descriptive names into the nomenclature of our subject:—

First. *Idiogenic¹ Nuclei*.—Those stone-centres which originate spontaneously within the body.

¹ From *ἰδιος*, proper to one's self, and *γένεσις*, origin.

Second. *Xenogenic*¹ *Nuclei*.—Those stone-centres which are of foreign or extraneous origin and introduced into the urinary passages.

IDIOGENIC NUCLEI.

By far the largest majority of calculi are of course found to be deposited upon *idiogenic* nuclei, for it is due only to accident or to some very unusual circumstance, that foreign bodies ever find introduction into the urinary cavities or passages.

To attempt a discussion of the origin and mode of production of our first class of calculous nuclei, would be but to repeat some of the most intricate, and not always most satisfactory, investigations of modern urology; such as would not at all comport with either the object or the restricted scope of the present paper. Much that is fairly reliable, however, has been with increasing certainty arrived at; and in the excellent works of Prout,² Golding Bird,³ Harley,⁴ Black,⁵ and Roberts, it will be found that more or less particular attention has been given to the initial crystallization of the special elements of the urine, that may or may not become the beginning of a renal or vesical calculus; everything depending upon the locality of its detention or whether it be retained within the body at all. Of the common products of the urine, uric or oxalic acid or cystin are those most frequently found to constitute the idiogenic centres around which the phosphates of lime, magnesia, or ammonia are deposited. While any one of these materials, especially, it is said, the cystin, may of itself constitute the entire stone or may be found to alternate in regular succession with any of the phosphates, or possibly, though more rarely, with each other.

“In connection with the origin of calculi,” writes Dr. Harley, “there is another point deserving of particular attention, namely, that local causes are the most potent in the production of stone, and that, even where the predisposition to it exists, without some local cause no stone is likely to form.” This remark is doubtless in every respect true, for all observations and experience teach that, whatever may be the condition of the subject’s health, and however normal may be the urine in its constitu-

¹ From *ξένος*, foreign or strange, and *γένεσις*, origin.

² Stomach and Renal Diseases. Philadelphia, 1843.

³ Urinary Deposits, 1859.

⁴ The Urine and its Derangements. By George Harley, M.D., F.R.S., 1872.

⁵ Functional Diseases of the Renal, Urinary, and Reproductive Organs, 1872.

ents, from the moment any object is presented that may serve as a nucleus, the deposition progresses with more or less rapidity. On the other hand, it is equally well established, that daily precipitations of uric acid or of the phosphates may go on for years, and yet, there being no nucleus present, a stone is never formed. The question as to what determines the initial crystallization—whether in the kidney or in the bladder—which is to form the nucleus, and again, as to what accelerates the precipitation which is to form its homogeneous or its alternating crust, are mysteries which we fear are at present beyond our grasp. The chief interest of the inquiry into the significance of a certain number of our cases resides in a question distinct and separate from these, and one which may be formulated thus: *What are the influences which underlie the various calculous diatheses, and what are the instrumentalities by which the urinary cavities and passages are rendered liable to the deposition of calculous concretions within them?* This question is here stated, as it pertains more particularly to the consideration of our first class of nuclei. Its discussion will be deferred until after the presentation of a number of cases, some one or two of which we think have a particular bearing upon its solution.

There is another variety of idiogenic nuclei, the mention of which, at least, we think it is here necessary to record; first, because by many authors they are confidently referred to as being frequently, some say invariably, concerned in the rationale of the formation of stone centres; and secondly, because more than one of our own cases most unquestionably indicate, that the calculi had been formed upon nuclei belonging to the class to which we are about to refer. These which, for convenience, we must necessarily class among the idiogenic nuclei, may be represented by agglomerations of vesical mucus, and by hardened blood-clots remaining in the bladder and serving as centres of deposit for the precipitable oxalates or urates, or for the phosphates of lime or of ammonia and magnesia. Vesical mucus, we have little doubt, is in young children most frequently the cement of the primitive nucleus upon which the deposits are made, though of this, we distinctly state, our opinion is based more upon the observation of the frequency of vesical irritation in this class of patients than upon any chemical analysis or experimental research. As will be seen hereafter, a uric acid calculus of considerable dimensions was unquestionably formed, in one

of our female cases, upon an inspissated blood-clot remaining in the bladder.¹

XENOGENIC NUCLEI.

There is but little that it is necessary to say concerning the specific characters of extraneous bodies which happen to become the centres of vesical calculi; they seldom or never originate renal concretions. To enumerate them would but involve the task of searching through the records of lithotomy, and then making a catalogue of sometimes rare, curious, and astonishing objects which have, at one time or another, been found to constitute the nuclei of stone. Among them, pins, needles, slate-pencils, a bit of bee's-wax, barleycorns, beans, hair-pins, bougies, catheters, a foetal tibia, pieces of wood, besides many other unheard-of and curious substances which accident or hallucination has, at various times, caused to be introduced into the bladder—would all find their places in the surprising lists recorded by various surgeons. We could greatly extend this marvellous exposition, but the contour and character of the substance have seldom much to do with the process of stone-deposit. It is only a solid body, whatever its nature may be, that is required to supply the conditions necessary for the accumulation. "Any solid substance, indeed," says Dr. Harley, "may prove the starting-point of a vesical stone, just as a thread, a piece of string, or anything else, may form the nucleus of a crystal of sugar candy."²

One of the questions of chief importance relating to xenogenic nuclei, is that which bears upon their *modus operandi* in initiat-

¹ "As regards the first step in the formation of vesical calculi," says Dr. Harley, "it may with equal justice be said that, whenever the predisposition to stone exists, it requires but a very trivial cause to bring it into operation; for, as with renal calculi, almost anything may act the part of a nucleus round which the stone will become deposited. An insignificant particle of mucus, a microscopic portion of albumen, or an epithelial cell is all that is requisite for the purpose. In the vast majority of vesical calculi, indeed, it is impossible to detect the primary point round which the urinary salts become adherent; but every now and then we come upon calculi with well-marked nuclei, some of which are not only quite foreign to the urinary passages, but even foreign to the body itself."—*Op. cit.*, pp. 134-5.

² For a numerous collection of singular nuclei, we refer the reader to Dr. Gross "On the Urinary Organs," to Eve's "Remarkable Cases in Surgery," and to other systematic works on lithology and surgery. Dr. John Godfrey, of U. S. Marine Hospital, Mobile, Ala., reports that a filiform bougie retained in the bladder, had thirteen small calculi upon it, like beads, when removed by lithotomy.—*N. O. Med. and Surg. Journal*.

ing and in accelerating calculous precipitation. *Is their action in this precipitation only that of "the thread" or of "the piece of string in sugar candy," or—vital elements being considered—do not both idiogenic and foreign nuclei exert a far different and more positive influence than the quasi catalysis of their mere presence?*

This problem which seemed to us unavoidable, is again one, of which we hope to attempt the solution, in connection with some of the examples of both idiogenic and extraneous nuclei hereafter to be presented.¹

A Vertebrated Catheter Broken. The joints and connecting wire-chain being left in the bladder as nuclei for calculous precipitation. Bilateral lithotomy. Recovery.

CASE XXXIV. George S. Almond, of Elbert County, Georgia, aged twenty-six years, in March, 1878, after certain "head-symptoms" found himself, without having had stricture previously, the subject of severe spasmodic trouble in his bladder. On 15th and 16th March he had obstinate retention of urine. On 17th a vertebrated catheter was used by his physician. On its first application the instrument was broken, and the entire number of joints with the wire-chain were left in the bladder of the patient. The distress, of course, was greatly increased, and the retention of urine continuing, an ordinary silver catheter was used successfully to empty the bladder. Two or three days after, three of the joints were removed from the urethra by his physician. Six weeks after some four or five more came away spontaneously, and also a piece of the wire which had been used by the village watchmaker in repairing the instrument which had been broken previously to its application in his case.

From the time of the accident to that of the operation, July 30, 1878, he suffered continued distress and tenesmus, "passing very small quantities of urine every fifteen or twenty minutes, night and day, and having scarcely any rest." He was much emaciated and worn down with irritation and some fever; had frequent chills and febrile exacerbations. On this account, notwithstanding the intense heat, Dr. M. P. Deadwyler, into whose hands the case had fallen, insisted on an immediate operation.

¹ We here gladly make our acknowledgment to Prof. W. W. Dawson, of Cincinnati, whose beautifully prepared and polished specimens we preferred to our own, on account of the distinctness of the strata; better illustrating our views on nuclei, during the reading of this paper.

The foreign body being plainly cognizant to the sound, bilateral lithotomy was performed at the City Hospital, in which we were assisted by Drs. John S. Coleman, A. Sibley Campbell, E. C. Goodrich, E. Foster, and others. The lithotome was set for a small incision in perineum and bladder, as we thought a large one could not be necessary. The object, or objects, were readily seized and removed by the forceps. They consisted of four of the joints of the catheter, and seven links of the wire chain, from which the other eight hollow joints had slipped off and passed out of the bladder as previously stated. Two of the joints were deeply incrustated with calculous matter, and also five of the links of chain, the cavities of all the joints were also filled. It had evidently been rubbed off from two of the joints by attrition in the bladder. The drinking water of this patient showed no evidence of lime by the ammonium oxalate test.

The patient did well after the operation, the urine dribbling away at intervals from the wound and sometimes passing from the urethra. The wound was almost healed by the end of a week. On the seventh day from the operation secondary hemorrhage suddenly took place. The bladder became filled with large clots which greatly distended it and caused intense suffering. The hemorrhage was probably caused by the patient's getting up to the close-stool, most imprudently, to pass his water. The urine was passed through the wound, but from the first so small had been the incision, involving the sphincter so little, that he had control and passed it only "when called on." The hemorrhage was finally arrested by the *tampon en chemise*, which was kept in for one night. The urine after removal was again passed as before under control. He took quinine daily, and left the hospital well on the seventeenth day after the operation.

Remarks. It will be seen by our next case (XXXV.) the breaking of a bougie is not an unprecedented occurrence, and in the course of this report one or more catheters have been found to constitute the nucleus of calculi giving rise to lithotomy. The vertebrated catheter being somewhat a recent invention, it would scarcely have been expected to furnish, as yet, many nuclei for calculous precipitation, and yet our own case, as just reported, is not without a precedent in the brief history of this dubiously useful contrivance. An amusing account was published recently in one of our medical journals in which the patient who had been in the habit of using a vertebrated catheter for evacuation

of his bladder, sent to his physician "to send him another, as his old one had been broken off and lost in his bladder, and he could not get along without *something* to empty his bladder." Ignorance truly is bliss!

In the *Union Medicale* of June 11, 1878, M. Lannelougue communicated to the Société de Chirurgie a case on the part of M. Fleury, of Clermont. The subject was a gentleman, 78 years of age, of robust constitution and remarkable energy. In 1863 M. Civiale performed lithotrity on him, and he had been obliged ever since to use a catheter, a slight vesical catarrh remaining. The instrument was five millimetres in diameter, and had become roughened from long usage. He introduced it easily as usual on April 23d, and on withdrawing it he found a portion remained in the canal; in place of sending for his physician to extract it, he forced it into the bladder with another instrument. M. Fleury, when consulted, advised "expectation," as he considered the attempt to remove a metallic body of those dimensions would be very doubtful of success, and cystotomy at his advanced age would be hazardous. There was but a moderate degree of inflammation caused by its presence. Catheterism was performed without difficulty. *Four days after*, during an effort at stool, *the end of the catheter presented itself at the anus*, and was removed after a few tractions. From this time the pain diminished, and no urine passed out of the rectum. The patient resumed his former habits of life, and the bladder held the urine for five or six hours as heretofore. It is most probable, we think, that this fragment did not pass out by ulceration, as seems to be supposed, but that it was pushed through the recto-vesical septum at the time that the patient forced it into the bladder with the other instrument.

The following cases have relationship and bearings upon other considerations, besides the one which has been throughout this entire communication our chief object of interest and pursuit, viz.: *To arrive at a demonstration, or haply only a theory, of the cause of litho-genesis and of the calculous diathesis.*

Demonstration or theory, we are of course by no means indifferent as to which it shall be regarded; but our desire is to give what coherence we may be able, to many scattered and disjointed facts, long in possession of the profession, which bear directly upon our subject and which, by proper consociation, we humbly hope may offer an explanation where as yet, to our knowledge, none has been systematically attempted.

Cases of Vesical Calculus with Xenogenic or Foreign Nuclei. The rate of calculous precipitation. The solubility of calculi.

The following case of calculus with extraneous nucleus would appear to indicate the solvency of stone under the influence of change in drinking water, besides approximately illustrating the rate of calculous deposition.

CASE XXXV. J. T. O'D., a young gentleman aged about twenty-five years. He was originally a resident of New York, where, while under treatment by a surgeon some two or three years previously for stricture, he sustained the accident of *the breaking of a wax bougie in the bladder*. Efforts were made at the time to remove the foreign body, but he had suffered from vesical irritation up to the time of our examination in Augusta, in 1860, at which time we found in the bladder a stone of considerable dimensions. Leaving New York shortly after the accident with the bougie, he had lived a rather sedentary life in Florida, where he suffered only occasional inconvenience. Lithotomy was strongly urged upon this patient at the time of our examination. He however refused, and being separated from him he did not come again under our care until 1863, when he was detailed as a clerk in one of the military hospitals at Richmond, Virginia, of which I had charge. He had been pronounced unfit for active service on account of the urinary difficulty. During his residence in Richmond, he had a varying amount of discomfort with his calculus. After some months he began to have frequent attacks of vesical irritation, urine became turbid and then sandy; power of retention impaired. "On one occasion," as he described the occurrence, "as he was descending an irregular path down Church Hill, he felt the stone change its position; he had an urgent desire to urinate but without being able to pass any water. Violent and uncontrollable straining followed, in the midst of which *he distinctly felt something crush in the bladder*." He soon passed some urine with great pain, and it was highly colored with blood. Some small fragments of stone passed out with the urine. One of these of considerable size lodged in the urethra and was removed by instruments next day. After this he was constantly distressed by urethral obstructions. Dilatation was begun, but the rapid decline of the patient rendered this too slow a process. He was soon confined to bed, had irritative fever, with offensive and purulent urine. Ascertaining by the sound that there were

considerable masses in the bladder too large to pass the urethra, and too numerous for the precarious and irritating process of lithotrity in his extreme condition, we urged the operation of lithotomy as an immediate and imperative necessity. The bilateral operation was performed in the presence of the staff of the hospital and several medical gentlemen of Richmond. About an ounce and a half of broken uric acid stone was removed. Though very friable, there were many large lumps, showing how forlorn would have been the hope of spontaneous expulsion. No wax or other material of the bougie could be discovered, but along the centre of one or two of the large pieces, a distinct groove indicated plainly that the stone had been moulded upon a cylindrical staff of about No. 10 size. The wax had doubtless been dissolved or disintegrated in the many years that had elapsed since the deposit had begun. In this operation Dupuytren's instrument had been carefully set for a moderate cut, as the patient was rather of short stature. It must have been meddlesomely handled. The freedom of the backward cut greatly surprised us, and there was considerable hemorrhage at the time, which soon ceased. In some three or four hours after, the most alarming bleeding took place; so profuse that it must be acknowledged that it was to be feared at the time, one or both of the internal pudics had been cut. Having no *tampon en chemise* I improvised one from the vaginal tube of Mattson's syringe, by which means the hemorrhage was promptly arrested and did not return. The patient rapidly regained his flesh, and, hearing from him some five or six years after, he had enjoyed uninterrupted good health.

The Solubility of Calculi.—To the above rather prolonged description we feel compelled to add certain observations based upon notes taken at the time the above case was under our care. We think there are some interesting and unusual considerations attaching to the origin, structure, gradual disintegration, and final crushing of the stone, which may have, perhaps, a practical bearing. During the progress of the calculous deposition upon the wax bougie, our patient had changed his residence and consequently his drinking-water *four times*. He had lived over a year in New York City after the accident, drinking most probably the soft Croton water; then, about three years in Florida, where the water is hard with calcareous elements; after this he remained more than one year and a half in Augusta, Georgia,

using drinking-water entirely soft from the Sand Hill Turknett Springs, by which the city was then principally supplied. At this time the stone was detected and found, though large, to be as yet single and unbroken and rather oblong, so far as could be estimated by combined examination through the rectum and urethra. He then removed to Richmond in the latter part of 1862. He had resided there perhaps about six months, when evidences of solution and disintegration began to be shown. These ended in the final "crushing" as above described.

It is well known to those familiar with the geological characteristics of Virginia, that among its rich variety and abundance of mineral waters, analysis has developed, in several sections of the State, that *sulphate of alumina and potassa* in various combinations very largely predominates. Rockbridge County, located over one hundred miles nearly due west from Richmond, is, by general notoriety, most abundantly supplied with these aluminous ingredients, though the catchments furnishing the percolation must be very extensive, for in Henrico County, where Richmond is situated, at least in the vicinity of this city, the impregnation renders the water from some springs almost undrinkable. This we found to be the case with certain wells or springs from which some of our hospitals were supplied during the war. This area extended over a portion of Henrico County lying upon the James River, and comprehending Church Hill, Chimborazo Heights, and other elevations selected for military Hospitals. We cannot say how general was the aluminous impregnation of the water, but in the particular hospital, the First Georgia, in which our patient resided, the solution was strong enough to render the water disagreeable to persons unaccustomed to its use. To what extent this last change of water may have influenced the sudden, rapid, and almost fatal disintegration and crushing of the stone, or whether it may have been the alum or some other ingredient in the water, could only have been determined at the time by elaborate experimental processes perhaps, the conduct of which were obviously incompatible with the engrossing demands upon the time and attention of a military surgeon in charge of hospitals, surrounded by daily battle and in the very centre of active war. The tubular or spool-like form of the stone, it will be remembered, presented an internal as well as an exterior surface for the application and chemical action of alkalinized urine upon the uric acid concre-

tion of which the stone undoubtedly consisted. We do not know that urine would be alkalized by the habitual drinking, for six months, of this or even a stronger solution of the same ingredients. Such, however, are the main facts relating to our case, the rather inaccurate account of which, as to the dates of its early history, we greatly regret.

The two following cases though not belonging to the catalogue of lithotomy we introduce in connection with Case XXXV. as illustrative of the influence of "constitutional solvents."

CASE XXXVI. R. Y., a young white man, aged about eighteen years, resident of Augusta, came under our care in 1845. He was the subject of much vesical irritation supervening on gonorrhœa or upon the abuse of diuretics as we supposed; vesical tenesmus constant. This was easily quieted by very moderate doses of morphine— $\frac{1}{8}$ gr.—three or four times a day. The form of administration had reference to the acid urine, which was found to be present. Bicarbonate of soda was a prominent ingredient in his prescription. A brick-red deposit would reappear in the vessel after standing when the soda was omitted.

R. Chloric ether	f℥j.
Sodæ bicarb.	℥ss.
Morph. sulphat.	grs. ij.
Aquæ camph.	f℥viij.

Mix and write: Take one tablespoonful two or three hours apart, p. r. n., to relieve irritation.

Though the above preparation afforded much relief, a continuance of irritation induced us to insist on sounding for stone. This was done in the presence of and assisted by our friend Prof. L. D. Ford, of this city, a short time after our beginning attendance upon the case. We both repeatedly, and each time without difficulty, developed with the sound to our entire satisfaction the presence of a considerable calculus. Grating and clinking against the steel sound was unmistakable. The stone was movable both by the sound and on changing the position of the patient. Lithotomy was strongly urged, but the patient insisted that the alkaline mixture kept him perfectly comfortable, and stated that he "preferred taking medicine all his life to submitting to the operation." He soon passed from the observation of both of us, and for many years we had no contact with his case. Early in 1865, being called to attend his second wife, we requested him to give us the history of his case subsequent to our last interview. He stated that as we had refused to give him any more

morphine he concluded he would continue to take the alkaline mixture which had so long relieved him; that he continued to procure the medicine by the same formula, neither increasing nor diminishing any of the ingredients. He had left off medicine years ago, but has had no return whatever of vesical irritation. He insists that we must have been mistaken as to the fact that he was the subject of stone. In which opinion it is unnecessary to say he was entirely in error. Since engaged on this report we called upon our former patient, now a robust active man of nearly fifty years, engaged in the daily work of a car-builder; when he repeated this portion of his history, but refused and, we think, not unreasonably, to submit to sounding, fearing, as he said, that the use of instruments might reproduce his former troubles.

We think it legitimate to ask the question: May not the prolonged use of the alkaline preparation, nearly a drachm of bicarbonate of soda daily, for so many years, as it was known to clear the urine of sediment—may it not, we say, have also effected the gradual solution and removal of a uric acid calculus? There is no reason for believing that this patient has ever been operated on, or that he would have concealed the fact of the present existence of stone, did he still suffer from any of his former symptoms. The probability of the encystment of such a large free-moving calculus is also quite unreasonable.

The following case is one which, more than any other in our experience, or in our knowledge of the reported experience of others, seems to demonstrate almost positively the solvent properties of alkalines constitutionally administered:—

CASE XXXVII. P. B., aged about sixty years; had been for over thirty-five years a citizen of Augusta, Georgia. He was stout and robust at the time of applying for treatment, but he had formerly been the subject of a mild cerebral attack—probably apoplectic; from this he seemed now to have entirely recovered. He reported that he had for some years suffered with a gradually increasing irritation of the bladder—having to rise often at night and passing but small amounts of urine each time. His urine showed decided acid reaction by litmus, and sometimes there would be found an adherent red sediment in the chamber vessel.

Taking into consideration the patient's age and the fact that he had once been the subject of a disabling cerebral accident,

we naturally regarded his vesical trouble as an annoyance by no means to be surprised at. Enlarged prostate to our mind accounted sufficiently for the irritable bladder. The excess of uric acid seemed easily explained, he being a robust man and heavy eater for one of his age, leading now a somewhat inactive life. He had as yet never required the application of the catheter to empty his bladder. The idea of vesical calculus did not for a moment occur to us.

1st.—R. Bicarb. potass. ℥iss.

Water Oj.

Mix and label "Alkaline Solution." Dose, one tablespoonful in combination.

2d.—R. Citric acid ℥j.

Water Oj.

Mix and label "Acid Solution." Write: Dose, one tablespoonful in combination.

These two solutions were taken together in a gill of water three or four times a day during effervescence; syrup of buchu being added to each draught.

The above proportions we owe to the valuable work of Dr. G. Roberts on Urinary Diseases. The device of modifying the prescription into an effervescent draught is our own. It was simply intended to alkalinize and lessen the acrimony of the urine—as we had advised it to many others. Some four or five weeks after he had been taking the effervescent draught, not having in the meantime paid him a visit, we were urgently requested to visit Mr. B. at night. He stated that the irritation had been much relieved for a time, but that, recently "he had been passing bits of gravel, that they had several times nearly stopped his water, and he thought now there was a large one in the channel, as he could pass no water at all." He exhibited several of the pieces, and they were unquestionably fragments of a uric acid calculus, angular and jagged, not specimens of a multiple gravelly deposit. Having brought with us only a gum-elastic catheter, we introduced it with some difficulty, pushing back the object into the enormously distended bladder. He had suffered with this distension for many hours. There was passed into the vessel more than a quart of dark bloody-looking urine. When the catheter was removed, a small angular fragment of the uric acid stone was lodged in one of the eyes of the instrument. We subsequently on several occasions attempted the introduction of a steel sound to explore the bladder, being now

confident that there was a large quantity of disintegrated stone in its cavity. This we found quite difficult of accomplishment on account of the greatly enlarged prostate, but more especially on account of the determined opposition of the patient. He would not consent to the use of even a silver catheter—by which we had hoped to make a less imperfect exploration. Being quite ingenious and apt, he soon learned to apply the gum elastic catheter himself, and as he suspected that we had been in some way the cause of his present trouble—and we are glad to say we rather unpremeditatedly were—he dispensed with our daily visits and was skilfully relieved, night and morning, either by his wife or by his own hands, by means of a No. 10 flexible instrument we had selected for him.

This patient was kept continuously under the use of the alkaline draught. On our occasional visits, he would show us the gradually accumulating mass of the uric acid fragments which he was daily passing from his bladder, till over an ounce had been collected in a quinine bottle. Of course we could not fail to recognize the connection between the continued taking of this decided alkaline and the passing away of so many masses of uric acid stone. To demonstrate this relation we made the experiment of putting a considerable lump of the calculous matter into a vial containing some of the combined solutions. In less than fifteen minutes, by shaking, the entire fragment had been dissolved, leaving a clear solution without precipitate.

About this time, we were much gratified when the patient desired that we should request our friend Dr. Henry H. Steiner of this city to visit him. Of course the interest of the case was equally great to both of us. We repeated the experiments, demonstrating the entire solubility of the fragments in the solution. We debated the expediency of injecting a weaker solution into the bladder, but as the progress of the case, however, was highly satisfactory, we delayed this experimental measure for a later period, and it was finally never attempted. The fragments became fewer and smaller till at last they have disappeared from his urine altogether. We are sorry to say, however, that this gentleman requires still the application of the catheter, seemingly on account of muscular atony, probably from frequent over-distension,¹ or possibly this obstinate atony may have had

¹ See "Self-injection of the Bladder," by W. H. Van Buren, M.D., and E. L. Keyes, M.D., New York, 1875, for valuable remarks on the subject of atony and over-distension.

its origin in the single occasion of prolonged and enormous over-distension in which he first required the catheter.

From the developments of the above case, we think we may fairly conclude that the patient had been the subject for perhaps a considerable time—since the first show of vesical irritation—of a gradually increasing uric acid calculus; that as with the advance of age and under the asthenia incident to his crippled sensibility from cerebral disease and the enlarged prostate, this stone became more obstructive than formerly. And, finally, that the persistent use of the alkaline solution caused its gradual disintegration ultimately resulting in the removal of the last particle from the cavity of the bladder.

A case almost identical with the above, and said to be related by Mr. Travers, tempts us to place it in relation with our own. A tailor, who had long labored under symptoms of stone, was sounded by Mr. Travers a few years since, who detected a hard calculus of some size, and counselled immediate operation. The man being afraid to incur the risk of the proceeding, put himself under the care of a person at Henley-in-Arden, who administered a “constitution water” to the extent of two or three pints *per diem*. The patient soon began to pass fragments in quantity as after the operation of breaking, the act being attended with acute pain, both before and during micturition. The pain and discharge of fragments continued for many months; both subsided at last and at the same time. The patient, on one occasion, showed him a box full of fragments, for the most part reduced to powder.

This man was examined after death by Dr. Charles, of Putney, and no trace of stone was discovered in the bladder.

Dr. Prout stated the basis of the “drink” to be carbonate of soda and potassa with a little nitre in the following proportions:

R. Sodæ carb.	.	.	.	.	.	grs. x.
Potass. carb.	.	.	.	.	.	grs. viij.
Potass. nitrat.	.	.	.	.	.	grs. ij.

J. F. SOUTH (CHELIUS.)

It will be remarked that in each of our three cases, soda or potassa entered largely into the composition of the solvent; first, potassa in combination with alumina; secondly, the bicarbonate of soda; and lastly, the citrate of potassa—seemed each to possess the desired property of effecting the disintegration of this variety of deposit.

Constitutional Stone Solvents.—The literature of calculous diseases was, not very long since, quite rich—we may say burdened, with considerations relating to the lithontriptic methods of removing calculous deposits from the body. These have enjoyed a varying degree of confidence from the profession. From about the year 1700 to the first third of the present century, seems to be the period in which the most rational views in regard to such methods were entertained. The general result arrived at, with most seeming reliability was, that alkalies would dissolve the uric acid deposits, and acids the phosphates, though these last, it was thought, required injections into the bladder containing the stone. The brilliancy of surgical measures and the more certain and prompt relief obtained by “cutting for stone” and the still more attractive idea of “crushing,” soon dimmed the little light that was beginning to dawn, and which in time might have guided us into the occasional use of chemical methods. For the last fifty years or more they seem to be forgotten, or at least never appealed to in the removal of vesical calculus under any circumstances whatever. We would here venture humbly to suggest, in view of the significant facts furnished by our above three cases, and the one case of Mr. Travers, that possibly, with the present advanced condition of chemical knowledge, *the lithontriptic plan*, either constitutionally administered or by well-devised injections into the bladder *might be so far revived* as that it may be resorted to in cases wherein circumstances indicated both the cutting and the crushing operations to be fraught with special or unusual danger to the life of the patient. Possibly, some of those who die under lithotomy, or wear out under lithotrity, in advanced life, might be gradually and safely freed from the burthen of a uric acid stone, by modern improvements on some of the lithontriptic methods, which our ingenious predecessors labored so industriously, yet failed so signally to establish, as “*the bloodless treatment of stone.*”

GUN-SHOT CALCULI OF THE AMERICAN CIVIL WAR.

Doubtless the lodgment of a ball or particle of bone or of wadding of cartridge, or of other foreign matter, in the cavity of the bladder, as an accident of battle, has not been a mishap of very infrequent occurrence during the late war. Besides the two rather remarkable cases of this kind reported in the present catalogue, we were cognizant of two more that came to our

knowledge during the time of hostilities, and a few others which have been brought to our attention in a letter, referred to us by Dr. Mastin, from Dr. Otis, of Washington.¹ The two above mentioned were in the hands respectively of Prof. A. E. Peticolas, of Richmond, then surgeon of hospitals at that post, and the other was an operation, we understand, of Prof. Paul F. Eve's, of Nashville, then military surgeon in charge of hospitals in Augusta, Georgia. In the case of Surgeon Peticolas, the lateral operation was at once performed, and a considerable buck-shot was removed from the bladder of a Confederate soldier, on his arrival from the battle-field. There was no calcareous deposit and the case made a good recovery. A longer time had elapsed in Dr. Eve's case and calcareous incrustations had formed, to a moderate extent, before the removal of the lead.

The two following cases of gunshot calculus will be found, we think, to present some points of interest beyond the mere novelty and paucity of such records.

*Gunshot Calculus—Nucleus, a minie-ball—Bilateral lithotomy.—
Recovery—Calculus over a quarter of a pound in weight.*

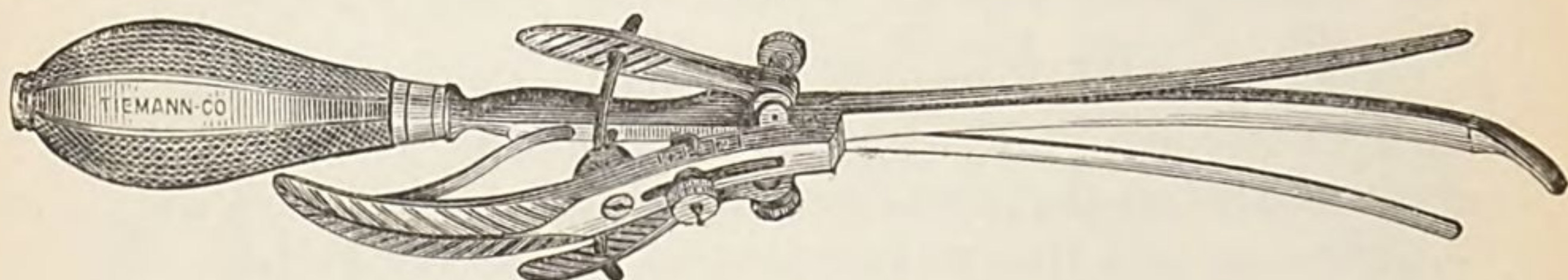
CASE XXXVIII. Private W. B. Griffiss, a Confederate soldier, aged twenty-five years, a resident of Abbeville District, S. C., was wounded on the third day of the battle of Gettysburg, July 3, 1863. At the time of examination he was the subject of a distorted and shortened union of a fracture in the upper third of the right femur. He stated that the fracture was produced by a minie-ball wound received at Gettysburg, and that he had suffered from symptoms of irritation in his bladder, and more or less trouble in making water, from the first moment of receiving his wound until the present moment. On its being suggested to him that the ball had probably lodged in his bladder, he promptly replied, that this was impossible, for it was removed, in a mashed and flattened condition, from a situation near the fracture, at the time his wound was dressed by the surgeon on the field. For many months he had been unable to retain his urine. It dribbled away involuntarily from the urethra both night and day. He was pale, emaciated, and exhausted from

¹ See *Boston Medical and Surgical Journal*, Feb. 7, 1878, p. 163. Art. "Notes on Contributions to the Army Medical Museum," etc. By George A. Otis, M.D., etc.

loss of rest and protracted suffering. On the introduction of the sound, a large calculus was found to occlude the entrance of the bladder, and it could also readily be felt to be fixed in this situation, by passing the index finger into the rectum. The sound could, however, be pushed on, without the exercise of any imprudent force, so as to be passed under the stone into the lower fundus of the bladder. The sound could here be felt from the rectum, between the under surface of the stone and the intervening walls of the two cavities. It was quite large and evidently irregular in contour. One of the prolongations very plainly occupied a fixed position in the neck of the bladder.

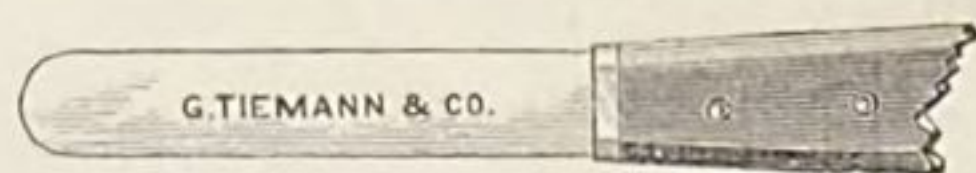
January 22, 1868. Bilateral lithotomy was performed at the City Hospital in presence of the class of the Medical College of Georgia, and assisted by Prof. Edward Geddings, Dr. J. S. Coleman, Drs. S. C. Eve and R. C. Eve, and others. Fully appreciating that we had a large and irregular mass to extract, Dupuytren's Adult Double Lithotome was set to very nearly its full adult size (Fig. 1). For the preliminary curved incision in

Fig. 1.



front of the anus, we mention here, we always prefer, as most convenient, a short, straight knife with a round blade, not over an inch in length. With the forefinger of the left hand kept in

Fig. 2.



the rectum and the thumb pressed on the raphé, we carry this blade repeatedly, if necessary, in a curve in front of the thumb, till the plane of the grooved staff is nearly reached. When the groove can be distinctly felt, we cut, with the same knife, a half-inch longitudinal incision, and *keep the nail of the left index in this incision until we are sure our beak has glided along the groove into the bladder.* We have seen Dupuytren's operation fail, in otherwise skilful hands, for the want of this particular manage-

ment of the nail of the left index finger. We shall not, perhaps, in any case hereafter refer to any habit of our own in the performance of this well-known operation. On making the backward cut with the lithotome, we attempted to remove the stone by the forceps, but found it impossible to move it, so firmly fixed was it behind the symphysis pubis, the bladder being contracted down upon it. The opening could not be dilated sufficiently, either by tearing or stretching, to extract the wide-spreading calculus. A narrow, probe-pointed, curved bistoury was now conducted along the palmar surface of the index finger of the left hand to the commissure first of the right and then of the left incision in the bladder and prostate gland, and thus the lithotome-cut was carefully extended on both sides. The large, irregular mass was even now with difficulty extracted. One of the angles, to be described hereafter, was broken off and had to be taken out separately. The patient did not lose any serious amount of blood, but we find on our record of the case, that "the shock of the operation was very great."

January 26th. Patient doing well. No hemorrhage—urine flowing freely through the wound—some has passed several times through the urethra. Fig. 3¹ conveys a good idea of the contour and dimensions of the stone extracted in the foregoing operation. Its weight was *over a quarter of a pound*—four ounces and four drachms avoirdupois. In shape it more nearly resembled a very large meerschaum pipe than anything else we can liken it to. The expanded portion, representing the bowl of the pipe, had evidently rested in the cavity of the bladder, having been there moulded in contact with the mucous membrane against its anterior wall behind the symphysis and body of the pubis, while the narrower elongated portion, more than an inch and a half in length, and of the size of a man's thumb, had accumulated and rested in the neck of the bladder. In composition, it evidently belongs to the class of ammonio-magnesian phosphates, though, as yet, no careful analysis of it has been made.

Fig. 3.



Section of a vesical calculus formed about a fragment of a musket ball. Specimen 6732, Army Medical Museum, $\frac{1}{2}$.

¹ From Dr. Otis's paper in the *Boston Medical and Surgical Journal*, Feb. 7, 1878, p. 169. See also Fig. 5, specimen with Bone Nucleus.

Considering his low condition and the rather severe character of the operation, Griffiss made a rapid recovery. He left the hospital in twenty days, and returned to his home in Abbeville. Forty days after the operation, he (quite imprudently, we think) began the work of ploughing his land for a crop. We did not learn, however, that any evil consequences resulted from this premature resumption of hard labor. On carefully inspecting this calculus, its origin and history are clearly revealed, while its situation, contour, and certain other peculiarities are quite satisfactorily accounted for. Notwithstanding the confident and unquestionably sincere statement of the patient, it is very apparent that the minie-ball, or at least a very considerable portion of it, had found its way into the bladder at the moment of the wound, that it must have gravitated towards the outlet or neck of that viscus, and that it had there remained clasped edgewise in the passage—partly in the cavity of the bladder and partly in the cavity of its neck—probably since July 3, 1863. All the wounds had closed, as there were no fistulous tracks, at the time we examined him, for either pus or urine in either the thigh or pelvic region.

Such was the nucleus of this gunshot calculus so far as can be ascertained by simple external examination. It is evident that the weight of this portion of the ball, flattened on its way to the bladder by contact with the femur at the seat of fracture, kept it immovably fixed in its situation. The urine at first passed out in a channel divided by the edge of the septum it presented. The calcareous salts, it is probable, began at once to be precipitated on all the surfaces which could be bathed by the urine. This contact of urine and deposit of salts was effected upon every portion of the leaden disk except on the very lowest edge, where with its weight and possibly some *jamming* it rested upon the floor of the bladder and lower wall of the urethra. Here the lead is devoid of calcareous covering and can at any time be readily brightened by scratching with the nail. The precipitation progressed, doubtless, comparatively slowly at first; but as a larger and larger surface was being constantly presented, probably thereby adding to the irritation, while the same *contour and proportions* were maintained, the *dimensions* increased in geometrical progression; till, in the comparatively brief period of about four years and six months, the enormous

weight of over a quarter of a pound had been attained.¹ The breadth and circumference of this leaden nucleus we cannot give for the obvious reason that we are unwilling to run the risk of injuring or perhaps destroying so remarkable and valuable a specimen. As a physiological *experiment* made on the living human body, the observations pertaining to this case and to the one following may, perhaps, in their own restricted way, be humbly compared, in the matter of *opportunity*, to those of Dr. Beaumont, as made in the case of the wounded soldier, Alexis St. Martin. Such opportunities have been but rare, and we are fully aware that time has not been allowed us to utilize the many valuable deductions with which such unusual phenomena are richly endowed. Such are the facts, however, and we can only hope that, pregnant as they may be with important results, they may be made useful by others in attaining clearer insight into the mysterious influences guiding and controlling the rate and character of calcareous accumulations precipitated from human urine under local irritation.

Scarcely less interesting, and much more remarkable in certain particulars, will be found the experimental aspects of our second case of gunshot traumatic calculus, also a result of the late civil war.♦

*Gunshot traumatic calculus—Nucleus, a fragment of pubic bone—Urinary fistula in the gluteal region—Virility, nullified during the presence of the fistula and stone, restored after four years, on bilateral lithotomy.*²

CASE XXXIX. M. J. C., colonel of a South Carolina regiment of the Confederate army, a married man aged about thirty-five years, the father of four children—the youngest an infant at the time he received his wound—was wounded at the battle of Malvern Hill, July 28, 1864. His residence, before and after the war, was Barnwell District, South Carolina.

September 26, 1868. On careful examination of Col. C.'s case, we found, that the ball had entered in front, somewhat to the

¹ See water history of this stone on subsequent page.

² A synopsis of this and the foregoing case was published in the *Boston Medical and Surgical Journal*, Feb. 7, 1878—"Notes on Contributions to the Army Medical Museum by Civil Practitioners," by GEORGE A. OTIS, M.D., Assistant Surgeon United States Army, Curator of the Army Medical Museum. Our illustrations are from his delineations. The calculus was bisected by Dr. Otis.

left of the symphysis pubis; that, perforating the body of the bone and traversing the bladder, it had passed out near the fold of the right buttock. At the time of our examination, he was suffering from extreme and constant vesical irritation. He passed but little urine through the urethra, but voided most of it through a fistulous opening near the fold of the right buttock, which opening was the wound of exit terminating the track of the ball which had traversed the body. He stated that there had been periods when the track appeared to have healed, and when all the urine passed naturally through the urethra. This, however, had not taken place now, for many months; the urethra seemed almost entirely closed, for only a little water dribbled away from this passage at the time of his efforts to pass urine, while nearly all of it was voided at the opening below the hip just mentioned. He seemed, however, to have pretty fair control of the passage of water, as he could retain the urine generally until he "was called on" to void it; at which time, as above stated, it passed almost wholly through the wound. The pubic wound was indicated only by a scar. He was greatly emaciated from imperfect nutrition, constant suffering, and frequent attacks of irritative fever. Compulsory sexual continence existed from the day of his wound to the time of the present examination. *His youngest child was, at this time, some months over four years of age.*

The rational symptoms of stone being present, though, considering the broken condition of the bladder, by no means necessarily indicating the existence of stone, an examination with the sound was made. A calculus of considerable size was at once detected at the very entrance of the bladder. It being firmly grasped by the circular fibres of the neck must have interfered, very decidedly, with the exit of the urine. He stated that he had never experienced trouble of any kind with his bladder, until struck by this ball; but from the very moment of his wound, the pain had been constant and distressing. With our recent experience in the case of Griffiss, we naturally suspected the lodgment of the ball in the bladder, but the patient assured us that this was impossible, as the entire minie-ball had been cut out from under the skin in the situation of the posterior wound, the track not being complete.

September 28, 1868. Assisted by our friends Dr. J. S. Coleman, Prof. Edward Geddings, Dr. Sterling C. Eve, and others of this

city, we performed ordinary bilateral lithotomy. The hemorrhage was not unusual at the time, and the stone was readily dislodged from its rather fixed position in the neck of the bladder. It is oblong in contour, its dimensions being about two and a half by one inch. It seemed to us rather light for its dimensions, weighing only one ounce and one drachm. It is soft, friable, and chalky. Upon testing it rather hastily, we concluded that it belongs to the class of ammonio-magnesian phosphates, as it dissolves very readily in weak nitric acid.

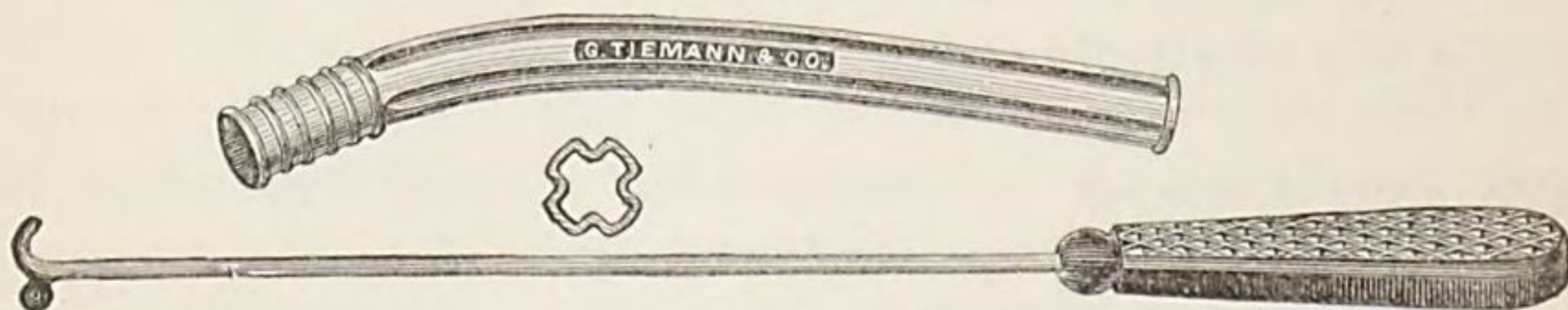
October 8th. The tenth day after the operation a sudden, profuse, and alarming hemorrhage occurred. We found the patient greatly exhausted—cold, clammy, and with a pulse almost imperceptible. The bleeding began while he was asleep; and, on waking, he found himself lying in an immense pool of blood. We quickly tore open the wound, on entering the room, by thrusting the index finger into the almost cicatrized cut; the finger fitted tightly, and the blood, of course, was under complete control till the *tampon en chemise* could be prepared. This was thrust into the wound and carried up well into the bladder, on the removal of the finger, and then the packing around the tube was firmly made with cotton, saturated in a pretty strong solution ($\frac{1}{2}$ oz. to Oj.) of Monsel's salt. There was no further bleeding. We have seldom felt greater apprehension about a hemorrhage, and therefore did not remove the tampon until the third day. The wound rapidly contracted again, and the case made a fairly prompt recovery. The fistulous ball-track had entirely healed before the patient left his bed; indeed, there had been no urine discharged from the buttock from the time of the perineal incision. It is our opinion that, as in the case of Sanders, Case XXIV., the artery of the bulb, and *not* the internal pudic, was here again the source of bleeding.

The grooved tampon en chemise—For arrest of hemorrhage in perineal lithotomy.

This instrument or apparatus, as heretofore and at present used and depended upon, has certain deficiencies which render it objectionable and unreliable for the arrest of a serious hemorrhage. It consists essentially of a tube some three or four inches in length, slightly curved near the vesical end and grooved circularly to retain the winding of the cord to hold the cloth or *chemise*. This tube, properly surrounded by the *chemise*, is intro-

duced through the wound into the bladder and then packed with cotton or sponge, saturated with some styptic lotion, to assist the compression in arresting the hemorrhage. The objection that we have found to this instrument is that the surface of the tube is smooth and rounded. In pushing in the saturated cotton with the *porte-mèche* it slips to one side or the other, and the packing is with difficulty placed accurately in the locality of the bleeding vessel, which, as we have said, is most frequently *the artery of the bulb* near the upper end of the wound. This point is the one, with the present form of instrument, most likely to be left unpacked and the artery uncompressed, so that the bleeding is apt to continue. To remedy this most dangerous defect in an instrument upon which the life of the patient often depends, we have devised what we have found an important improvement. In our instrument, made for us by Messrs. George Tiemann & Co., of New York, there will be found a deep groove upon each quarter of the tube rather more deep upon its upper side on account of the *bulbar artery*. Into this groove, when the packing is to be made between the tube and the *chemise*, or cloth—fine bolting cloth being the best—we lodge the lower fork of our *porte-mèche*, armed with the cotton, and push it on to the vesical end of the tube. This is repeated till on every side a sufficient number of pledgets of the styptic cotton is pushed up to pack well and firmly the entire wound from the vesical to the cutaneous end of the track. The grooves along the four sides of the tube serve to keep the fork of the *porte-mèche* steadily in the proper direction till it is well packed in on every side of the tube.

Fig. 4.



Campbell's Grooved Tampon en Chemise, and Porte-mèche with soft shank, for packing.

As a necessary attachment, we must have a *porte-mèche* made to accompany the tube, the forks being olive-pointed and smooth, so as not to tear the tissues or hitch in the *chemise* while the packing is being pushed on. We think that when the *tampon en chemise* has heretofore failed to arrest the bleeding, it has

been from the imperfect packing caused by the want of the groove, which we have now added, to direct and make accurate the compression upon the bleeding vessel. We have kept the instrument in the wound for several days, and it has served us well in a few most frightful hemorrhages, both primary and secondary, following bilateral lithotomy.

Though by the record of our own cases the proportion of deaths has been but two out of forty-nine under the various operations of lithotomy—principally the bilateral—still, according to the most recent estimates, *one out of three* for adults is the proportion of fatal results. It is known that this frightful mortality is largely due to hemorrhage, the accident which renders the operation so dangerous in the adult.

In view of the great fatality attending lithotomy at one time, bloodless evacuation of the bladder by crushing instruments became a great desideratum, and Civiale, in France, became the founder of the then new school of lithotrity. Among the earlier followers of Civiale, no one in this country more ardently advocated the method, or was more successful, than our distinguished friend and colleague, L. A. Dugas, M.D., Professor of Surgery in the Medical College of Georgia. Located in a region not highly productive of calculus, his list of operations yet comprehends thirty cases.¹ In this list there is but one negro. One, an infant of *six weeks*, in which the calculus, size of a grain of wheat, was obstructing the urethra, and was removed by dilatation. Of “twenty-nine cases, eighteen were treated by Dupuytren’s bilateral method, and seven by urethrotomy and dilatation.” Four of Dr. Dugas’s earliest cases were relieved by lithotrity, the operations being successfully performed at a time when Civiale was scarcely known and his method but little appreciated in America.² In later times, Sir Henry Thompson³ in England, and Prof. Bigelow⁴ in this country, have each greatly advanced the facility as well as the safety of this practice.

In the rapid strides made very recently in the methods of

¹ These cases have been collected but recently. They will be found in the Transactions of the Medical Association of Georgia, volume for 1874.

² The Report of the Commission of the Academy of Medical Sciences on Lithotrity is dated Paris, March 22d, 1824.

³ Practical Lithotrity and Lithotomy, London, 1871.

⁴ Litholapaxy, or Rapid Lithotrity with Evacuation, Boston, 1878.

lithotrity, we may hope soon to find lithotomy in the adult almost a procedure of the past. During the past two years Prof. Henry J. Bigelow, of Boston, has interested the profession by communications on the subject of "Rapid Lithotrity with Evacuation," through the *American Journal of the Medical Sciences* and the *Massachusetts Medical and Surgical Journal*. For the volume entitled "Litholapaxy," in which his views are carefully systematized, we here render grateful acknowledgment.¹ It is here made clear that in a large majority of cases in the adult, litholapaxy will supersede lithotomy, with a great reduction in the mortality of treatment. There will remain, however, many cases in which lithotomy will still be performed, and in these the almost inevitable occurrence of hemorrhage will give great importance to any instrument by which very nearly infallible control may be exercised over the bleeding so fatal in adult operations. Such an instrument we have found in the grooved *tampon en chemise* herein suggested by us, and which we now for the first time present to the profession.

A *nucleus of bone* was found in the centre of the calculus on sawing through its longitudinal diameter. The structure seems to be compact, and the surface exposed on each half of the divided stone runs longitudinally about one inch, and is nearly one-eighth of an inch in thickness. As it is embedded in the calculous matter,² its breadth cannot be ascertained without completely destroying the specimen. We may safely account

Fig. 5.



Vesical calculus formed about a nucleus of bone. Specimen 6733, Army Medical Museum, $\frac{1}{2}$.

for its presence in the bladder by the inference, that it is a portion, probably, of the posterior table of the body of the pubis, which was driven in and left in the bladder at the time that the ball passed through, splintering it off as in passing through a plank. Like the fragment of minie-ball in Griffiss' case, it had been soon carried to

the neck of the bladder and lodged in the outlet. At this place, the precipitation of calculous matter had gradually accom-

¹ As also for the following valuable papers: Lithotomy, by Reuben A. Vance, M.D., of Gallipolis, Ohio; reprint from the *Cincinnati Lancet and Observer*, March, 1877: Median Lithotomy, by Prof. J. H. Pooley, Columbus, Ohio: The Operation for Stone, as observed in the London Hospitals, with Seven Lithotomies, by Prof. A. Van Derveer, M.D., of Albany, New York.

² From the *Boston Medical and Surgical Journal*, Feb. 7, 1878.

plished the almost entire occlusion of the opening. On this account, it may be concluded, it was that the recently healed wound in the wall of the bladder and also the entire track of the ball had again become fistulous by reopening to give exit to the urine. As to the number of cases like the above, that have been operated on and recorded during and since the war, we have no ready means at present of ascertaining: we said, in the paragraph introducing our two cases just related, that we supposed that the lodgment of a ball, or a particle of bone, wadding, cartridge, or other missile in the cavity of the bladder, has *not* been a very rare mishap during our late war. Two cases of the kind, occurring to us, would rather indicate this opinion to be just.

A letter from Dr. George A. Otis, of Washington, referred to us May 8, 1876, by our friend, Dr. Claudius H. Mastin, of Mobile, seems to establish the fact that there are a number of such specimens in the collection of the National Museum. Dr. Mastin writes us, "Dr. Otis has, to this date, *all* the specimens of that kind, with the exception of one in Ohio, and *that will* be placed in the general museum. These are the only specimens now in existence, and they should be placed together."¹

EFFECT OF LITHOTOMY ON SUBSEQUENT VIRILITY.

On account of the alleged injury sustained by the vesicles and ejaculatory ducts, subsequent loss of virility has been urged against the bilateral operation, though Dupuytren himself held the ducts to be more safe from injury than in the ordinary

¹ Apart from "the pomp and circumstance of war" we are able to refer to two other cases entirely dissimilar to each other and also to ours, where *bone* became the nucleus of calculous concretions; our friend and relative, the late Prof. Paul F. Eve, of Nashville, while editor of the *Southern Medical and Surgical Journal*, in 1846, reports in the volume for that year the case of a woman, who, falling from a stable-loft, got astride a pin, and so injured herself that she was for a long time disabled." Dr. Eve performed lithotomy, and reports the case as "A portion of bone, probably of the pubis or ischium, removed after fracture, from the bladder, surrounded by a calculous mass." The vesico-vaginal operation was performed, and the woman recovered without a fistula.—*Remarkable Cases in Surgery*. By Paul F. Eve, M.D. 1857.

The nucleus of another stone in a woman is to be found in the collection of Dr. Robert Liston, of London—"a foetal tibia which found its way by ulceration into the bladder from the abdomen—the case having been one of extra-uterine foetation."—*The Urine and its Derangements*. By George Harley, M.D., F.R.S. 1872.

lateral procedure. The American Medical Association, during its session held at Louisville, Kentucky, May 1859, appointed a special committee, of which Dr. J. S. White, of Memphis, was chairman, to investigate "the effect of perineal operation, for urinary calculi, upon procreation in the male." Unfortunately we cannot refer to this report, if ever it were made, as the succeeding volume of the Transactions is not at this moment accessible. The appointment, however, is sufficient to indicate the manifest interest in this important subject. Of all the questions attaching to lithotomy, this one of *impotency* has been the one most difficult to answer to the satisfaction of all minds. However strong the case may be, in favor of the unimpaired virility of the father ordinarily, a loop is still left to hang a doubt upon, in the ungenerous and generally unfounded aspersion of the faithfulness of the mother. "Vicarious paternity" is, to the minds of these recusants, unwarrantable as the unkind suggestion may be, the yet unanswerable explanation given to the continued fruitfulness in the family when the father has undergone bilateral lithotomy.

In a former case, XXII., we were careful to state the circumstances under which impregnation was alleged to have been due to a patient, after recovery in the hospital from the operation; they, we admit, materially vitiate the reliability of the inference. In our present case, however, besides the most spotless character of the mother, we have a history of detailed events which, as by moral certainty, fully establishes the procreative power of the father, after recovery from quite an extensive bilateral cut:—

A young woman, of perfect health, bears children rapidly up to the period that her husband receives his disabling wound; a large calculus and the extensive urinary fistula interrupt sexual relations for over four years and four months at least; the last infant at the time of operation, several months over four years of age, is still their youngest child. The husband rapidly recovers after the operation, becomes robust, active, and cheerful. Child-bearing is at once resumed; a child is born within a year after the operation, and the rate of increase in the family since has been similar to that which existed previous to the gunshot wound. Was there ever more complete vindication of the loyalty of the wife or better proof of the unimpaired virility of the husband?

The above particularity may be considered by some wholly unnecessary; to our mind this is by no means the case. One

positive and unassailable fact, in a question so difficult to solve, possesses a value that is inestimable, even though that value extends no farther than to establish the negative—as we in all fairness are bound to admit—only in a restricted degree, viz., that bilateral lithotomy does not *in every case* injure the procreative power of the patient. Our valued friend and able colleague on the State Board of Health, Dr. F. A. Stanford, of Columbus, has within the last year or two reported, through *The Atlanta Medical and Surgical Journal*, his experience in about twenty operations of lithotomy. Like ourself accident determined his adoption of Dupuytren's procedure in his first operation, and a perfect satisfaction with his success caused him to adhere to the method. Aware of the alleged injury to virility charged against the operation, he mentioned several of his cases which go far to disprove that such injury is a common result. He states that "he has operated on men previous to marriage who afterwards became fathers of families, and that also, operating upon husbands, he found in their cases no interruption to the increase in their families." Many of our own cases came to us from a distance; others have passed from our observation. We have above reported the only two of which we have been able to gain particular knowledge in the matter of procreative ability after bilateral section.

As this paper is undergoing correction for the press, the following private note is received from Prof. F. L. Parker, of Charleston, S. C.: "*Apropos* of stone. I will now furnish you with one of your own 'forgotten cases'—one *not sterile*; has had four children. This makes two of our nine cases of yours successful and having issue. Why not trace out the history of some others, and solve the question of sterility after stone?" Dr. Parker continues: "Dr. Wm. J. Young, of Campbellton, S. C., sends me three new cases. One of yours, as follows: 'W. B. Sanders, white; always lived in Barnwell, S. C. By Dr. Henry F. Campbell, in Augusta, May, 1869, but not among the cases given you by him. In a year or two after operation, married, and is the father of four children. No further symptoms of stone. Have known him for six years.'" Case XXV. of the present paper is the one above referred to. It was overlooked in the list furnished Dr. Parker.¹

¹ "A Compilation of One Hundred and Thirty-one Cases of Stone in the Bladder in South Carolina, with Operations," is the title of a valuable digest of all lithotomies performed anywhere on calculi originating in South Carolina.

THE RATE OF CALCULOUS PRECIPITATION.

The rapidity or the slowness with which calculous accumulations are deposited has seldom been the subject, even of note, much less of etiological investigation by writers on urology. There can be no doubt that a careful examination of the reports of cases, guided by the object of establishing the rate at which accumulations progress, would result in the finding of a large number in which the time elapsing between the date of introduction of the nucleus and the removal of the stone could be unquestionably established, and thereby the data furnished by which reliably to estimate *the rate of calculous deposition*. In case No. XXXIV. of this report, we regretted that no account could be given of the periods at which the wax bougie had been broken in the bladder, though by it we ascertained that in a period of not more than five years, considerably more than one ounce of uric acid concretion, besides that lost after the disintegration, had gathered round the foreign nucleus. There can be no doubt that this rate of deposit will be found to differ in individuals, and, could experiment attest the fact, to vary according to certain circumstances and several occult influences in the same individual during the sojourn of the nucleus and stone within the cavity of the bladder.

Every one with the least experience is familiar with the rapidity with which catheters, both metallic and gum elastic, become coated if left in the bladder, hence the recommendation of their removal and replacement every four or six days lest they scrape and injure the urethra when withdrawn. No particular kind of object appears to possess advantage over others in the rapidity with which it will *excite* calculous deposition. There can be no doubt, however, that such objects as *produce most irritation* are those which become most rapidly covered; after being covered, all differences are equalized and the *rate* of production, we would think, would be the same, other things being equal, whatever might have been the nature of the nucleus originating the stone. One of the most rapid accumulations of

This rich collection most surprisingly vindicates this State from the *low rate* of calculous production hertofore allowed her by all statisticians. The thanks of the profession are certainly due to Prof. Parker for this valuable and painstaking report. It will be seen that in Case we add one more to this South Carolina list—performed since its publication.

a very large amount of calculous matter in a brief period is said to be found among the specimens in St. Thomas's Hospital. A female catheter had escaped from the hands of a surgeon into the bladder; fearful of getting into trouble, he said nothing about it, and "*some months after the woman had symptoms of stone.*" She was cut by Sir Astley Cooper, and a good-sized stone, *about an ounce in weight*, had formed around the catheter near its middle; the catheter lay across the bladder and its ends were pretty tightly fixed. Another case of Sir Astley's is reported in which *in a few months* after the entrance of a pin in the bladder of a child, he removed a stone by lithotomy. The weight of the stone is not given, and the rate of deposit cannot be estimated. From this it is clear that, with a little trouble, many cases might be found, in the records of the operation, bearing distinctly on our subject. In each of our own two cases of gunshot traumatic calculi, the date of introduction of the nucleus is accurately recorded in the date of the battle in which the subject of stone had been wounded, while the date of removal by lithotomy marks the termination of the period during which a given amount of calculous matter had been in process of accumulation.

In Case XXXVIII. private Griffiss was wounded July 3, 1863, at which time the fragment of minie-ball was lodged in his bladder. He soon returned to Abbeville District, S. C., where he remained partly confined to the house, but more often about his farm, till the time of the operation, January 22, 1868, a period of *four years six months and nineteen days*, at which time the accumulation by weight had amounted to *four ounces and four drachms avoirdupois*, and in composition was probably phosphate of lime. In Case XXXIX., Col. C. had the bone-nucleus driven into and deposited in his bladder in a gunshot wound received July 28, 1864. He returned to his home in Barnwell District, S. C., where he remained nearly the whole time confined to bed, until the time of the operation, September 28, 1868, a period of exactly *four years and two months*, at which time the accumulation by weight amounted to *one ounce and one drachm troy*, the composition being according to our test the ammonio-magnesian phosphate.

In comparing the calculi of these two patients, that formed upon the flattened fragment of ball in the bladder of Griffiss is, in addition to difference in composition, just *four times* the weight

of that of Col. C.'s formed upon a fragment of bone, in very nearly the same period of time. Under circumstances so nearly identical so remarkable a difference in the rate of calculus precipitation must necessarily suggest some inquiry as to its cause.

To those who regard renal and vesical concretions as being due to the mineral elements of the drinking-water of the subject, the chief inquiry will relate to the geological differences of these two regions. These differences are not sufficiently marked, on such a theory, to account for the facts. Abbeville and Barnwell are both river counties of South Carolina, located upon the north side of the Savannah, and less than one hundred miles apart. There is nothing in the geological constitution of the soil (both being we think principally alluvial), of either of them, upon which we could found the expectation, *a priori*, that calculous concretions would be from this source produced. Abbeville, the locality in which the largest concretion was formed, having as its chief constituent one of the salts of lime, we are told by those familiar with the soil, is remarkably free from all calcareous elements, and this patient is the only one who has consulted us for stone from that locality; while Barnwell, where the much slower deposit took place, though by no means a limestone region, is of the two less free from mineral products, certain tertiary or quarternary formations being sparsely scattered throughout various localities of this county. Though throughout this county, as well as throughout Abbeville, "soft water" is the only percolation of the soil, our patients from this region have been the more numerous and some of them remarkable for their diathetic characteristics. Three others besides the case of Col. C. are found upon our list and carefully recorded in our notes of operations. Two of these of very deep interest, but one particularly, O'Bannon¹ to be mentioned hereafter, presents an instance of the most abundant and persistent elimination of ammonio-magnesia and lime we have ever witnessed, and was marked by a rate of calculous precipitation far more rapid than any known to us in the records of surgery.²

¹ See Case XL.

² We have with great trouble been able to secure specimens of the drinking water from the *very wells* and springs used severally by Griffiss in Abbeville, and Col. C. in Barnwell, and find scarcely a trace of lime in either of them. We have these specimens still.

Water History of a Calculus—four ounces and four drachms in weight, accumulated during four years, six months, and nineteen days.—Case XXXVIII.—J. B. Griffiss.

We here detail the process by which the test was made for lime in the water, we may say, *exclusively* drunk by Griffiss during the formation of his stone. The delicacy of the test by solution of ammonium oxalate may easily be proved: According to Frederick Hoffman, ordinary aqua calcis contains only three-fourths of a grain of calcium oxide to the ounce of distilled water.

Process.—To test the delicacy of the chemical, we add four drops of lime-water to half an ounce of distilled water, shaking it well in a clean tube. On the addition of four drops of our solution of ammonium oxalate, a milky turbidity immediately took place, followed soon by a plainly perceptible deposit of lime.

Measuring out carefully into a clean tube half an ounce of the drinking-water to be tested in Case XXXVIII., four drops of the same reagent—ammonium oxalate—were added and well shaken. No effect whatever was produced upon the clearness of this water. After standing for hours there was no precipitate.

From the above result, we may consider the absence of *lime* as proved beyond question.

By the Soap-Test.—Fifty cubic centimetres of the same drinking-water were accurately measured from a graduated pipette into a clean vial: To this, c. centimetres of the standard soap-solution were gradually added (with shaking), to the point of producing a permanent lather. We found that the soap was continually destroyed, and no lather appeared until eleven centimetres of the soap solution had been added to the water—at which stage of our process the lather was permanent.

The above then indicates that this drinking-water, though devoid of any trace of lime (as just proved), is yet what Clark would call, “of eleven degrees of hardness.” This hardness doubtless depends upon the solution of the salts of magnesium and possibly other mineral solutions. The supposed composition of the stone (ammonio-magnesian) would rather confirm the supposition that the hardness of the drinking-water is due to magnesia. This magnesia probably contributed to the supply of the precipitated salts under the vesical irritation caused by the fragment of ball.

Conclusions.—From the analysis of the drinking-water in this most remarkable case, we may be led to conclude that, on the retention of an irritating nucleus in the bladder, whether idiogenic or foreign, other things being equal, mineral ingredients in the drinking-water, even as low as eleven degrees of hardness, must greatly accelerate the process of calculous precipitation.¹

As this is perhaps the most convenient connection in which we can refer to the effect of drinking-water upon the genesis of stone, we venture to anticipate our full report and briefly here epitomize a few points in the case of O'Bannon just mentioned in connection with that of Col. C., asking the reader to bear in mind that Barnwell District, though not entirely devoid of traces of lime in its soil, manifests nowhere, either in wells or springs, the slightest indication of mineral solutions of any kind.

He had lived in Barnwell to the age of fifty years, when under circumstances to be mentioned hereafter, he was lithotomized January, 1849, by Dr. Paul F. Eve, who removed $4\frac{1}{2}$ ounces of phosphate of lime. Returning to Barnwell he lived there a little over ten years, when he required his second operation. H. F. Campbell removed two ounces and two drachms by lithotomy July, 1859. Recovering, he again lived nearly four years at his old home when, becoming troubled with stone, he sought Dr. Eve in Atlanta, who in the third operation demanded by this patient April, 1863, removed eighteen calculi similar to those that had been removed in the two preceding operations. The aggregate weight is not given, but we may fairly estimate the amount safely at half an ounce, thus summing up in all about seven and a half ounces, the result of a persistent elimination of limy phosphate from the blood of the patient continued during a period of thirty-nine years.

During this entire period, as was the case with Griffiss and also with Col. C., did O'Bannon use water that was pure, and soft and entirely free from all calcareous salts—Let us ask, could the catchments of cretaceous Norfolk in white-cliffed Albion,²

¹ For the careful preparation of our reagents, and for most valuable assistance in the conduct of the above processes, we again make our acknowledgments to Mr. J. W. Pauknin of this city.

² "Not only here," says Prof. Huxley, "but over the whole county of Norfolk, the well sinker might carry his shaft down many hundred feet without coming to the end of chalk; * * * while on the shores of Kent, chalk supplies

or the lime sinks of Kentucky, or the shell-conglomerate regions of Florida, supply water that would crystallize more rapidly or into larger calculous concretions, after draining through the human blood and kidneys, than we find in the cases of Griffiss and O'Bannon?

That independently of the water we drink and of the soil upon which we dwell, the blood will sometimes contain the necessary elements, and that under the influence of some perhaps as yet unrecognized factor in the mysterious result, the kidneys will eliminate these elements and the bladder collect them into stone, we think no one in the face of such facts can pretend to deny.

The influence of "Hard," or Calcareous Water, in the origination of nuclei, and in the growth of concretions in the bladder and urinary passages.

No one assuming to offer a rationale for the genesis of stone, however just may be his premises or impregnable his conclusions, can afford to overlook those etiological relations which, from time immemorial, *drinking-water* has been acknowledged to bear to that mysterious process. Though, by the application of a more advanced physiology we may be able better to comprehend many aberrant facts and phenomena and to establish a lithogenesis more consistent with vital conditions than that which would liken these formations to the subterranean stalactite and stalagmite; still, the chemical considerations attaching to the water drunk and the soil lived upon, during calculous precipitation, have yet their proper and important place both as factors and conditions, and are ever worthy of the greatest weight, in all investigations pertaining to the etiology of stone.

Even prior to the time when the science of observation and chemistry had sufficiently advanced to admit of reliable demonstration, the fact was tacitly admitted that among the dwellers of "limestone regions" and the drinkers of "hard water," a larger proportion of calculus sufferers were to be found than could be produced among the inhabitants of primitive areas, who drank the pure "soft water" of granitic or silicious catchments.

that long line of white cliffs to which England owes her name of Albion."—Lay Sermons, Lectures, and Reviews. By H. Huxley, LL.D., F.R.S., p. 174.

"In Norfolk," says Dr. Cameron, "calculous disease is very common, and the waters in that county are very calcareous." A Manual of Hygiene Public and Private. Dublin, 1874, p. 80.

So striking, indeed, at one time, had *seemed* to be this almost universally admitted fact that sanitarians appeared for a considerable period to regard the proportionate hardness or softness of "potable water" as the standard of its *general* healthfulness, as undoubtedly it is, in many respects, a most available criterion of its purity. That calcareous water was considered notoriously "to produce stone in the bladder" was sufficient, quite early in the history of sanitation, to secure its exclusion as a drinking supply, from all towns and cities where "freestone water," even at a proportionately enormous expenditure of the public funds, was at all attainable. It will be seen, however, that this view is not always taken, even by sanitarians of the highest authority. "With few exceptions," says Dr. Cameron, "the new water supplies contain very little solid matter in solution, whilst the water formerly in use was, as a general rule, *hard*—that is, it contained from ten to seventy grains of solid matters per gallon. When the bills for the better supplying of Manchester, Glasgow, Dublin, and other towns with water, were before Parliament, the medical and scientific evidence adduced was nearly altogether in favor of soft water as against hard water. It was, to a great extent, on the faith of this evidence that Parliament was induced to sanction the expenditure of several millions of pounds for the construction of water works. After all this, it is rather startling to find a high sanitary authority—Dr. Letheby, medical officer of health for the city of London, stating that the use of soft water in a town greatly increases the mortality of its inhabitants. In his report on the sanitary condition of London, during the year 1869, he gives a table showing the average composition of the water supplied to the metropolis during the year, and from which we learn that the proportion of solid matter per gallon varied from 18.18 to 27.85 grains. The solid matter consisted chiefly of *lime salts*, which Dr. Letheby contends render the water wholesome. He says:—

"In this country it is remarkable that whenever soft water is supplied to the people, the mortality is large, even when allowance is made for the birth-rate of the place. Glasgow, as well as Preston, Dundee, Sheffield, Plymouth, Manchester, Bradford, etc., which are all supplied with water of less than four degrees of hardness, have a mortality which ranges from 26 to 34 per 1000; while at Birmingham, Bristol, Sunderland, Newcastle-on-Tyne, Wakefield, Dover, Norwich, Croydon, Worcester, Derby,

and other places, where the waters are hard, the mortality is considerably less; in fact it may be said that in towns supplied with water of more than ten degrees, the average mortality is about 22 per 1000; while in those supplied with softer water, it is about 26 per 1000.'

"Dr. Letheby," continues Dr. Cameron, "states that the *savans* appointed by the authorities of Paris and Vienna to decide on the quality of water to be supplied to those cities, reported in favor of water of moderate degrees of hardness.¹ One consideration seems to have powerfully influenced the decision of the French *savans*, namely, the allegation that more conscripts are rejected in the soft-water districts, on account of imperfect development and stunted growth, than in the hard. 'And if,' says Dr. Letheby, 'we regard the subject from another point of view, there is the striking fact that, *as three-fourths of the earth's surface is covered with calcareous strata, we are compelled to drink calcareous water, as if it were intended for a wholesome purpose*;² and it may well be, as the late Professor Johnson observed, that the bright sparkling hard waters which gush out in frequent springs from our chalk and other limestone rocks, are relished to drink, not merely because they are grateful to the eye, but because there is something exhilarating in the excess of carbonic acid they contain and give off, as they pass through the warm mouth and throat; and because the lime they hold in solution removes acid matters from the stomach, and thus acts as a grateful medicine to the system. To abandon the use of such a water, and to drink daily in its stead one entirely free from mineral matter, so far from improving the health, may injure it. In fact, the water of a country may determine the diet of the inhabitants. The soft water of the lakes of Scotland, for instance, may have had much to do with the use of brown meal; and but for the calcareous waters of Ireland, the potato could not have become a national food. Looking, therefore, at the plain teachings of all this, and considering the excellent quality of the water supplied to this metropolis (London), it would be folly, in my opinion, to change it for a soft water.'"

With somewhat of perplexity and dissatisfaction, which it

¹ This term "degrees of hardness" refers to the amount of earthy elements contained in solution in any given specimen of water, as determined by a "standard soap-test" to be described hereafter.

² The italics are ours.

appears to us, in a spirit of blunt candor, he is willing shall be seen, the learned and distinguished medical officer of health for Dublin thus discusses the unexpected, but yet well sustained and almost convincing arguments of his London colleague and contemporary:—

“The citizens of Dublin,” he complains, “have recently expended nearly half a million sterling in supplying themselves with water of about two degrees of hardness, instead of the water of from fifteen to twenty-two degrees of hardness, formerly in use in this city. If Dr. Letheby’s view be correct, the inhabitants of Dublin may justly complain that, acting upon the advice of scientific men, they have been led to worse than useless extravagance. It seems, however, strange that the use of pure soft water could be the means of largely increasing the death-rate of a town. The ordinary food which we use contains abundance of mineral substances, with which the bony structures of the body are nourished. Even if it did not, the quantity of useful earthy matter taken into the body through the medium of water, would be inadequate to subserve any useful purpose. (?) Let us take the case of an average sample of hard water supplied to London. It contains 16 grains of earthy salts per imperial gallon (70,000 grains weight, or 160 ounces). Few persons drink more than half a gallon of water per day, so that a person consuming that large quantity would derive from it only eight grains of earthy salts. It must be borne in mind, too, that by heating water, the hardness of which is due to the presence of calcic carbonate, a large proportion of the earthy salt is rendered insoluble. Much of the lime contained in the hard water used for domestic purposes is deposited in the tea-kettles, and other appliances of the household. *The quantity of lime in a man of 160 lbs. weight is about one pound, and an adult daily consumes in his food at least $\frac{1}{4}$ oz. of earthy salts.*¹

“As the lime contained in the bones is associated nearly altogether with phosphoric acid, and not with carbonic acid, it is evident that the chalk contained in hard waters cannot contribute (?) at least in an important manner, to the nutrition of the body.

“The apparent relation between the death-rate and the nature of the water supplies in the towns mentioned by Dr. Letheby

¹ The italics are ours.

is certainly remarkable; but I think the rates of Glasgow, Manchester, and other towns supplied with soft water, were not lower when the water furnished to them was hard. Dr. Letheby includes Dublin amongst the towns which have a very high death-rate; and yet, until very recently, that city was supplied with water of about the degree of hardness which Dr. Letheby considers desirable. So far as my observation extends, I am clearly of opinion that the substitution of the pure soft water of the Vartry for the hard water supplied by the canals, has produced an improvement in the public health." He finally refers to and quotes from Dr. Gairdner, late medical officer of health of the city of Glasgow, who was also the author of an excellent work on air and water. "The Highlanders and islanders of Scotland, who, despite many unfavorable circumstances, enjoy the credit of a low death-rate, almost all drink soft water; and I do not know a single fact showing that soft water, in the many instances in which it has now been brought into populous places, instead of hard, has in any instance led to an increased death-rate, or produced an appreciably bad effect, when the other sanitary circumstances were good." "In Glasgow, the whole of the west-end and well-to-do population drink Loch Katrine water, and do not suffer. The death-rate of the town is affected by quite other causes."

Papers of Dr. Murray, of Newcastle, of Dr. Cadge, of Norwich, and of others, are adduced, to prove that hard waters give rise to calculi in those who drink them habitually. In Norfolk calculous disease is common and the waters of that county are very calcareous. Prof. Gamgee states, that "sheep are very liable to calculi in the limestone districts." But, fair to the very last, here is his admission about hard water and stone, leaving all advocates of the aqueous origin entirely at sea: "If calculous disease resulted from the use of hard water, then it should be very prevalent in Ireland; *but this is not the case.*"¹ The italics are ours.

Much that is of inestimable value could be brought in relation with our studies in lithology, from that comparatively new but rapidly extending science of sanitation, which would illuminate some of the many dark corners heretofore left necessarily

¹ *A Manual of Hygiene; Public and Private.* By Charles A. Cameron, Ph.D., M.D., etc., Medical Officer of Health for Dublin, etc. Dublin, 1874. p. 80.

unexplored by the active but preoccupied men engaged in the practice of lithotomy. Surgery is so engrossing and responsible an art that those whose interest would be most aroused to the importance of questions relating strictly to its science, have seldom the time to enter into elaborate investigations, even for the correction or substantiation of opinions long held *sub judice*, from the simple lack of time and opportunity to decide them. As will be seen above, the energetic and enterprising activity of sanitarian investigators, working in behalf of their own special interests, is rapidly bringing to the goal of statistical determination that which has ever been, perhaps, the most unsettled and perplexing of all the questions pertaining to the etiology of calculous diseases, namely, the relative influence of hard and soft water upon the origin and progress of calculous precipitation.

No one, perhaps, in this or any other country or age, has labored in a more determined and philosophic spirit to bring to light the amount of influence which this one, as well as all other circumstances and conditions, exerts upon the production of calculous affections, than has our able and illustrious countryman, Prof. S. D. Gross, of Philadelphia. Occupying one of the very highest positions as a lithotomist, and for years pursuing this department of surgery in that region of all others most productive of calculous affections, a master as well in pathology as in surgery, he has brought to the inscrutable problem rare qualities of both mind and experience to second an energy and a patience which are truly astonishing. In his great work on the urinary organs will be found laid up an encyclopædia of knowledge pertaining to this entire class of diseases; but the persistent devotion with which he has given himself to the collection of facts and statistics relating to the circumstances of the production of stone, is worthy of all praise, and places at the command of the investigator a rich treasury of data by which, if possible, he may attain to truth. By direct inquiry and correspondence, by tabulation and analysis of the published reports of all cases in all times and all regions, he has comprehensively pursued his work and allowed no aspect nor relation of the subject to escape his earnest search after the true cause of calculous concretions and of the calculous diathesis. Food, air, water, climate, elevation, locality; moisture, dryness, habits of life; its coincidence in distribution with other diseases, are some of the

many aspects of the subject in which he has considered this—evidently to him—most interesting of all the questions pertaining to lithology. Others, it is probable, may have to a certain extent followed this investigation, but none that we have any knowledge of, with the same comprehensiveness and clear-sighted discrimination as Dr. Gross.

The question which has greatest prominence is naturally that which pertains to the influence of the calcareous waters of limestone regions upon the production of calculous deposits. Every State in the Union, and various regions of most foreign countries throughout the world, are diligently considered in their relations to the production of stone comparatively as to hard and soft water districts. But after all, the question is left unsettled, and the patient and impartial investigator himself, at the end of his long series of reports from every region, it would seem, of the habitable globe, finds that on account of the contradictory character of the results obtained he is only more bound than ever to extreme caution in the delivery of the all-important decision.

These are his carefully weighed but candid words upon the subject:—¹

“It will be noticed,” says he, “in reading this part of the work,”—Appendix, p. 883—“that the great stone regions of this country are, as far as it is at present known, Kentucky, Tennessee, Virginia, Ohio, North Alabama, and perhaps Missouri. In all other sections of the country the disease is either very infrequent or comparatively rare. To what these differences are due has not been determined. To my mind, it is positively certain that no one cause can or does produce them. Doubtless, a combination of circumstances is at work, but of the nature and influence of this we are entirely ignorant. If we seek for an explanation of the difference in the difference of climate, geological formation, and habits of life, we shall be disappointed; for there are really no essential variations in any of these particulars between the several States above mentioned, or between these States and those which are in a great degree ex-

¹ A Practical Treatise on the Diseases, Injuries, Malformations of the Urinary Bladder, the Prostate Gland, and the Urethra. By S. D. Gross, M.D., Prof. of Surgery in the University of Louisville, etc. etc. Philadelphia, 1855.

We regret that circumstances deprive us of referring to a later edition of Dr. Gross's works.

empt from these affections. Thus, there is no essential difference in the climate, soil, and productions of Kentucky and Indiana, or in the food, drink, occupation, and modes of life of their inhabitants; and yet in the one, as will be presently seen, stone in the bladder is very frequent, and in the other very rare. It remains for medical philosophers to inquire into the circumstances, and to unravel them, if possible, in a scientific and tangible manner for the benefit of the profession and the public." He further remarks, before leaving the subject of water and food: "How far, or in what respect the development of stone is affected by food, drink, occupation, and climate, must, for the present, remain a matter wholly of conjecture. That they do exercise an influence, and that an important one, would seem extremely probable, and yet no one has succeeded in determining its character, or the share which each of these circumstances has in the production of the malady."

THE IMPORTANCE OF OBTAINING THE WATER HISTORY OF CALCULI.

We are not aware, that to the present time, any particular attention has been given in works on lithology, to what may be called the "water history" of calculous concretions by the methodical application of *tests* to determine definitely the amount of mineral elements held in solution by the water drunk, during the calcareous precipitation of any given case or number of cases. In the preparation of the present paper, we have become aware of the great omission on our own part, in failing to record any more than the general geological character of the locality in which the deposit had begun and grown to the time of extraction. In but a few of our more recent cases have we made analysis of the particular water used by the patient and his family. This measure, though at first sight appearing to add much to the trouble of the investigation of each case of stone brought for treatment, is in scarcely any case impracticable, and in the majority of them, is one of easy accomplishment; and it is believed by us would go far to define the limits in which we are hereafter to discuss the influence of calcareous water in the production of stone. Most of the subjects being of tender years and probably delicate from this cause, from earliest infancy have never left the place of their nativity nor changed the water drunk, from the initiation of the concretion by nucleus to the

time of removal of the stone. Did surgeons but request that a specimen of this drinking water be brought, either before or after the operation, the test might be made and this important fact in the history of the case developed and recorded. Much light, we are inclined to think, will be thrown upon this obscure line of investigation into the etiology of stone, when such analyses and records shall become the constant practice of the profession.

Until a very recent period, none but very elaborate, and, for the practitioner, almost impracticable processes, by which these examinations could be made, had been formulated. Examinations of the urine have been greatly simplified; and whether it is acid or alkaline; whether saccharine or albuminous; its specific gravity normal or otherwise; and also as to the character of the deposit itself; whether of uric acid or of lime, of magnesia or of ammonia; whether in combination with phosphoric or oxalic acid,—are all questions which the beautiful and exact science of urology has made simple and attainable to the busiest practitioner who may take the trouble to read the formulæ and provide himself with the few simple implements required for the easy process: but as we have said, the question of a history *anterior to this*, has seldom or never, we think, been the subject of analytic research.

The restricted scope and special object of this communication, forbid our devoting further space to the subject of “the water history of calculi,” a subject which we believe to be only incidentally connected with our discussion of the calculous diathesis. We would here, however, respectfully ask, to suggest the inauguration of a simple method of examination, with the view of testing the degree of hardness of the water used by patients *previous to the operation*, which, if constantly pursued, will place in the hands of the lithotomist this portion of the history of each case, the record of which has heretofore been generally so loosely and imperfectly made, or wholly neglected. It is again to a kindred department of medicine—sanitation, that we must look for assistance here in completing the history of calculous generation and growth. The importance of the subject of the constituents of drinking water, in answer to the benevolent claims of public health, has resulted in the establishment of a systematized method, simple and easy of manipulation, which if transferred to lithology, would, we think, supply the de-

ficiency so constantly met in all records and reports of the history of calculus.

SOAP-TESTS FOR HARDNESS.

Water chemically pure, it is said, is not obtainable out of the laboratory of the chemist. Both organic and mineral impurities are found in solution in every specimen of water that has a natural origin. With the organic vitiations we are not concerned, nor any more with a very large number of the mineral impurities. Some two or three of these last, however, are almost invariably present in a greater or less degree. Those that more particularly concern our investigation, are the calcium and magnesium salts so often held in solution and to which are due, almost entirely, what is known under the name and quality of "hardness." These are sulphates, carbonates, chlorides, nitrates, and phosphates of the above metals, acquired during percolation through catchments in which they more or less abound.

To come directly to our tests; the term "hardness of water," as is well known, is derived from the common popular observation of the *soap-destroying property*, in a greater or less degree, of all water holding the above salts in solution. Based upon this known cause of hardness, Dr. Clark, of Aberdeen, Scotland, conceived a plan for measuring by a standard test the amount of mineral ingredients held in solution by any given specimen of water. It is to him, that we owe the ready facility with which this important question may now be determined by lithologists as well as by sanitarians. We are not aware, however, that either Dr. Clark or any one else has heretofore attempted to apply his test in determining the "water-history" of calculus. This use of his method, and for such an object, we believe was first made by us, and is here for the first time reported.

In order to give an idea of Clark's method, it will be sufficient to state, that to arrive at a *standard degree of hardness*, he dissolved with care, sixteen grains of Iceland spar (pure carbonate of lime) in a gallon of water, denominating this, as "water of sixteen degrees of hardness." Finding then the exact amount of a certain soap-solution (one ounce to the gallon of water) would by measure be destroyed by a proportionate amount of the standard calcareous water, he upon this plan establishes his method of testing the strength of the mineral solution—whether above or below "the standard sixteen degrees of hard-

ness," in any given specimen of water to which he might wish to apply his test. It is quantitative as to the combined amount of minerals in solution, but does not discriminate them qualitatively.

So important do we regard the object of rendering easily accessible to the profession the ready means of determining accurately the water history of every calculus offered hereafter for treatment, that we here introduce, without apology, Clark's method of preparing *The Standard Soap Solution*, and also *The Water of Standard Hardness*, as simplified by Mr. Sutton. Those used in our analyses were prepared for us by Mr. J. W. Pauknen, of this city:—

“Standard Soap Solution.—The following are Sutton's excellent directions for preparing this test: Put together in a mortar 150 parts common lead plaster (*emplastrum plumbi*) and 40 parts of dry carbonate potassium. When they are fairly mixed, add a little methylated spirit, and continue triturating until a uniform creamy mixture is obtained. Allow to stand for some hours, then throw on a filter, and wash several times with methylated spirit. The strong solution of soap thus obtained must be diluted with a mixture of one volume of distilled water and two of methylated spirit (considering the soap solution as spirit), until exactly 16 cc. are required to form a permanent lather with 50 cc. of water of standard hardness. The mode of conducting the operation is that described in the text; but we will suppose that the operator finds the solution too strong: suppose 50 cc. of standard water uses up only 14 instead of 16 cc. of soap solution, we dilute 1.400 cubic centimetres with 200 cc. of a mixture of two volumes of plain spirit and one of water—mix thoroughly together and again determine the strength so as to make certain that exactly 16 cc. are required for 50 cc. of standard water.”

“Water of Standard Hardness.—Place 2.29 grammes of pure colorless calc. spar in an evaporating dish of about one-quarter litre capacity. Pour over the mineral a little water, and add, drop by drop, pure strong hydrochloric acid. The calc. spar dissolves with effervescence, forming a solution of calcium chloride; the liquid is evaporated to dryness in a water bath. Water is then added, and the solution again evaporated to dryness. It is necessary to repeat this evaporation several times, in order to insure the removal of excess of hydrochloric acid. But these operations must be conducted so as to avoid the slightest loss. The residue is finally dissolved in distilled water, and the solution poured through a funnel into a litre flask; the capsule and funnel are then repeatedly rinsed with water, and the rinsing received in the flask. The liquid is

then made up to the bulk of a litre, and the whole well shaken and then poured into a dry stoppered bottle, and labeled 'Solution of 16° of hardness.'"¹

We have thus been led into the discussion of drinking-water by the rapid rate of precipitation characterizing several of our cases. A more unquestionable decision could have been made in regard to them had the water of the particular wells or springs, used during the period of accumulation after the introduction of the nuclei, been carefully tested. This indeed can be done at any time hereafter.²

It seems to us, and we respectfully suggest that it would be proper, that systematic works on urology and lithology should hereafter contain the formulæ necessary for the practical application of Clark's soap-test in establishing an *accurate water history of calculus*. For our present purpose, it is only necessary to refer to some of the works on public health in which they are contained.³

A Case of Multiple Calculi resulting from injury to the spine; calculous production continued during thirty-nine years, in a soft-water district. Repeated lithotomies: seven and a half ounces of calculi; each stone with uric acid nucleus.

CASE XL. Samuel O'Bannon, white, aged sixty years; residence, Barnwell District, South Carolina. This remarkable case, presenting what may be called "a perpetual quarry of phosphatic limestone," is not unfamiliar to the medical profession. The graphic pen of our revered and distinguished preceptor, the late Prof. Paul F. Eve, of Nashville, has furnished its history in a communication rich in wisdom and experience to this Association during its twenty-seventh annual meeting, held in San Francisco, May, 1871. The exigencies attendant upon the com-

¹ Op. cit. Appendix.

² As stated in a former note, the specimens of drinking water in each of these cases have been obtained since the above writing. The exact "degrees of hardness" cannot be stated, but in neither the water drunk by Griffiss nor that by Col. Crawley during the period of their stone formation was there more than a trace of calcareous solution.

³ The Manual of Public Health for Ireland. By Thomas W. Grimshaw, J. Emerson Reynolds, Robert O'B. Furlong, and John William Moore. Dublin, 1875, pp. 227. A Manual of Hygiene, Public and Private. By Charles A. Cameron, Ph.D., M.D., etc. etc., Medical Officer of Health for Dublin. Dublin, and London, 1874, pp. 76 *et seq.*

pendious tabulation of one hundred cases have resulted in a slight irregularity in Dr. Eve's recountal of Mr. O'Bannon's case; we, therefore, assisted by his synopsis, will attempt here to present the main facts and dates of the case consecutively:—

Operation 1. By Dr. Paul F. Eve, at Augusta, Georgia, January, 1849. Age of patient at that time, reported by Dr. Eve, forty-three years (according to our record, made on second operation, fifty years); residence, Barnwell District, S. C. Bilateral lithotomy at City Hospital in presence of class of Medical College of Georgia; multiple calculi, $117 = 4\frac{1}{2}$ ounces, chiefly phosphates: result, speedy recovery.

Operation 2. By H. F. Campbell, at Augusta, Georgia, July, 1859, somewhat over ten years after the remarkable operation of Dr. Eve. The patient reports that he has continued to live in Barnwell since first operation—we are certain that he reported himself to us at this time as being *sixty years of age*—he had the appearance of seventy. We think the age recorded by us was correct, and that consequently he must have been *fifty* at the time of Dr. Eve's first operation.

He stated that “he had been injured in the spine in 1824, when quite a boy,” about fifteen years of age according to our dates. After getting up, or perhaps while still confined, “he suffered very much with his water,” and soon began to pass “gravel-stones,” which often obstructed the passage of his urine. We recognized him as the man from whose perineum and bladder we had assisted Dr. Eve at the City Hospital, when he removed over a hundred calculi of limy constituents. Dr. Eve it appears had now requested him to come to us for operation, he having removed to Nashville. The stones removed by Dr. Eve varied in size from that of a split pea to a hickory-nut or almond. We are confident that at the time of his operation in 1849 the bladder had been entirely cleared of gravel and calculous fragments. He reported to us now, however, that “he had soon begun to pass gravels” after Dr. Eve's operation, but he said he was certain there were a great many in his bladder that had come there since Dr. Eve had cured him, and he felt confident some of them were too large to come away. There was scarcely any trace of the scar left by the first operation. On introduction of the sound, it was felt to pass through a bed of gravel which the instrument seemed to encounter before fully entering the bladder. An obscure grating could be felt in the perineum by pressure on the

skin and intervening tissues against the convexity of the sound. Though sixty years of age, and though extremely emaciated and worn down by irritative fever, we still felt it our duty to attempt the relief of this man by lithotomy. It was evident that he could not live unless some measure of relief was adopted.

Assisted by Drs. Robert Campbell, S. B. Simmons, and others, we performed the ordinary bilateral operation, the patient being first stimulated with whiskey and anæsthetized by chloroform. *Fifty-eight calculi*, exactly resembling in every particular those removed by Dr. Eve ten years before, were now removed. Two or three of them were fully the size of pigeon-eggs, and from this they diminished in proportion down to those of the smallest peas. These stones, we are confident, were not all in the bladder, but some of them appeared to be in a sac in the region of the prostate gland, which sac seemed to communicate with the cavity of the bladder by a small opening. We think a full report by Dr. Eve of his first operation would reveal a similar state of things at that time. We did not have them tested, but decided that they belonged to the "triple phosphate" variety, perhaps with phosphate of lime. Dr. Eve has noted those removed by him as "phosphate of lime." We observe that they all have a varnished appearance, and that some appear beautifully glazed. This glazing, Chelius says, is "a layer of urate of ammonia." As reported by Dr. Eve in regard to this operation, performed by us for him, "he made a good recovery." He recovered very slowly, but entirely, from the operation, and returned to his home in Barnwell. Some year or two after we had heard of his being still alive, but we were only made aware of his having submitted to the operation a third time on reading the published analysis of Dr. Eve's cases above mentioned.

Operation 3. By Dr Paul F. Eve, Atlanta, Georgia, April, 1863, nearly four years from our own operation, the second—fourteen years from Dr. Eve's, the first—and thirty-nine years from the date of the spinal injury in 1824, which dated the beginning of calculous elimination—may we not say *secretion*? The operation was again bilateral lithotomy. Eighteen calculi, similar to those removed in the two previous operations, were now removed. Dr. Eve again records them as composed of "phosphate of lime: result, "death." "He did well," writes Dr. Eve, "until the twelfth day, when he was attacked with erysipelas of the hand and forearm, and died; the wound had nearly healed." He was now at least sixty-four years of age.

In all, the number of calculi removed in the three operations besides those passed spontaneously, of which the number cannot be estimated, was one hundred and ninety-three. Lithogeny probably continued uninterruptedly during a period of thirty-nine years—that is, from the time of the spinal injury in 1824 to the time of his death in 1863.¹

Were we presenting O'Bannon's case as a *curiosity*, its value as such would be greatly diminished by reference to systematic works. Multiple calculi, though not by any means so common as single or double or triple ones, are by no means unprecedented in lithology. Dr. Gross, up to 1855, had but one case, a gentleman of Kentucky, aged seventy-six years—fifty-four calculi; in the bladder of the naturalist, Buffon, were found fifty-five; Sir Astley Cooper had one case of a hundred and forty-two; Dessault, one of over two hundred; Kruger, Dupuytren, and others, had similar cases; Dr. John Kelly, of New York State, removed two hundred and twenty-eight; Tulpius, Boerhaave, Beauchene, and Ribes each record a case of upwards of three hundred. “In the case mentioned by Ribes,” says Dr. Gross,² “three hundred were found in the bladder of a man after death *who had undergone lithotomy three times*,” in this particular being similar to the one under consideration. Murat met with six hundred and seventy-eight; Schurig, seven hundred; the most extraordinary example on record being the case of Chief Justice Marshall, operated on by Dr. Physick, where upwards of one thousand calculi, “from the size of a partridge-shot to that of a bean, were removed.”

The above cases are indeed very marvellous, but the antecedents not being accessible, they do not equal in *value to us* that of O'Bannon and some others to be mentioned, so far as our particular line of study is concerned. Our own other case of multiple calculi—Case XXIX.—is also of no value to us, as we have neither record nor recollection of its concomitants. The five calculi are of similar appearance to those removed from O'Bannon.

Our friend Dr. John S. Coleman, of this city, during the winter of 1875-6, consulted us in a case in which after relieving *an almost impervious stricture*, which had long been a source of irri-

¹ We regret that our most strenuous efforts have failed to procure the drinking-water in O'Bannon's case. Nobody can identify him by “name or local habitation.”—O'Bannon was *poor*.

² Op. citat, p 445.

tation and distress, he discovered the patient, a white man, aged thirty-six years, to be the subject of one or more vesical calculi. Bilateral lithotomy was performed in presence of the medical class and three white varnished looking calculi readily removed; they were about the size of filberts. Exploring instruments through the urethra still producing a grating, the bladder was deluged with cold water, but the object was not removed. After some search two other similar calculi were discovered and removed from a pouch just below the neck of the bladder, which pouch was found, as in our case, to communicate with the cavity of the bladder.

This man, so far as we could ascertain, had suffered no spinal injury. Could the long-existing irritation of the severe stricture have excited the generation (secretion?) of nuclei by reflex influence upon the bladder and kidney? That the irritation consequent upon injuries and diseases of the penis, as well as diseases of the spine, have been apparently etiologically connected with the generation of calculi within the urinary passages, there can be no doubt. Dr. J. F. South, the English translator of Chelius's Surgery, relates several cases illustrative of this kind of action. A young man, twenty-three years of age, was under the care of Dr. Vincent in St. Bartholomew's Hospital. He had received upon the penis the kick of a horse, from which, suffering incontinence of urine, he wore a yoke to prevent the flow. A swelling was found behind the scrotum at the time of his admission. This had attained the size of a goose-egg. When opened, it gave exit to one hundred and forty-six calculi, of various figures and sizes, the largest being about the size of a horse bean. The sac communicated through the urethra with the bladder. The stones consisted of "the fusible compound (phosphate of lime and of ammonia and magnesia) formed upon indistinct nuclei of urate of ammonia."

Vincent had another case of numerous calculi, which, with about two hundred others, were removed from between the prepuce and glans penis of a very old man. *The patient had congenital phimosis*—a source of great irritation—the orifice of the urethra (prepuce?) scarcely admitting the introduction of a common probe. From the presence of the calculi, the prepuce was distended to the size of a pullet's egg, and retention of urine was finally produced. This patient had during many years experienced great pain and difficulty in making water. The calculi

were composed of the phosphate of ammonia and magnesia, with phosphate of lime—"fusible compound." "For the composition of the nucleus," says the college record, "there can be no doubt that the greater number of those calculi had passed from the urethra into the sac of the prepuce, and their irregular form and close adaptation to each other, proves that in this situation they had increased considerably in size by the deposition of earthy phosphates."

The similarity of these cases in the size, shape, and constitution of the calculi to those removed from O'Bannon's bladder and perineum, the generation of which were seemingly the result of *perverted nervous action, consequent upon the spinal injury*, there being no obstructive stricture or phymosis, is very remarkable. There can be no doubt that in all these cases above quoted, from some cause or other, the lithic or uric acid diathesis had been established, initiating the generation of numberless idio-genic uric acid nuclei which, but for the existence of the obstruction, would probably never have resulted in stone at all, but have passed away, undetected,¹ with the daily passing of urine.

The following case, our most recent lithotomy, is here appended, as the operation was performed since the reading of this paper.

CASE XLI. A. McF., of Port Royal, S. C., aged 28 years. In 1872, found his urethra obstructed, and the urine dribbling away. He applied to Dr. Stewart, of Beaufort, S. C., who, by use of a catheter, relieved the greatly distended bladder. He used the catheter for two months, when the symptoms of "stricture" subsided for three years. During another attack of urethritis, August, 1878, he was suddenly seized with vesical distress and retention, and again had to use the catheter. He was now treated in Charleston, S. C., for stricture—by internal urethrotomy. On his return to Port Royal, finding the symptoms unrelieved, he came to Augusta for treatment.

Examination, Feb. 10th, 1879. Stone of considerable size detected near the neck of the bladder by the sound.

¹ In the published cases heretofore mentioned in this paper, Dr. L. A. Dugas reports that of "a man of fifty, who had suffered many years with gravel which he continually passes. He has a collection of over twelve hundred, passed in a few years. They are round, and resemble a collection of shot of all sizes."

May 16th. McF. returned for operation at this time, but on account of his impaired health, he remained under tonic treatment till the 10th of June.

Operation, June 10th, 1879. Assisted by Drs. John S. Coleman, Edward Geddings, A. Sibley Campbell, and other medical gentlemen, we performed ordinary bilateral lithotomy, the patient being "under ether."

Nothing unusual occurred during the operation. The stone presents a fine specimen of alternating limy and uric acid strata deposited upon an oblong uric acid nucleus. Long diameter, $2\frac{1}{8}$ inches; short diameter, $\frac{7}{8}$ of an inch.

Hemorrhage.—In this operation, the lithotome was set for a moderate incision. The bleeding, though not profuse, continued during the afternoon. At night, considerable clots began to pass from the bladder through the wound, while fluid blood came through the penis. With the valuable assistance of our friend, Dr. J. S. Coleman, the bladder was emptied of a mass of clots, and washed out with tepid, then hot and then cold water. It being now plain that packing was necessary, we applied the *tampon en chemise*, with pledgets of absorbent cotton saturated in tannic acid. The tampon tube being without grooves, rendered the packing difficult and uncertain. The flow was finally arrested, and the urine ran clear from the tube. The tampon was kept in fifty-five hours, till signs of suppuration in the wound were observed. This length of time was probably unnecessary. There was no indication of hemorrhage after removal of the tampon. Though the urine came from the wound, the patient *had control*, and passed it at intervals "with desire."

Notwithstanding the long interruption of over two days by the tampon, the perineal wound healed with remarkable rapidity. Urine soon began to pass through the penis, and McF. returned home well on the 25th of June—fifteen days after the operation.

Water History of the Calculus.—At our request, Mr. McF., on his return for operation, brought from home specimens of the drinking water he had used during his residence at Port Royal—a period of over seven years—(his first symptoms of vesical trouble began in 1872). These specimens were not subjected to Clark's test, as at that time we had no means of "standardizing" our soap solution. The preliminary process with solution of ammonium oxalate showed only the very faintest cloudiness,

there being no perceptible precipitate, even after standing for hours. The lime entering into the composition of this large stone was certainly not derived from the water drunk by the patient at Port Royal.

Remarks.—In the above, as in the several other cases of hemorrhage reported in the foregoing paper, we think the *Bulbar Artery* was the one which was cut, and which yielded the alarming amount of blood. Wounds of this vessel, many years of observation have impressed us, are quite serious, and fully capable of bleeding the patient to death if not promptly and efficiently dealt with. Fortunately they are, we may say, always controllable by pressure. We believe that the grooved *tampon en chemise* offers the most convenient and reliable means of applying this pressure.

Give QUININE till the wound is healed.—In the after treatment of the foregoing case, as in that of every other, *quinine* was given to the extent of ten or fifteen grains a day. This *rule*, which we cannot now argue, we never depart from. Over thirty years of experience has irrevocably fixed our convictions as to its inestimable value.

In concluding our remarks upon this last series of cases, illustrating the persistent and abundant genesis of calculous matter, we call attention particularly to the fact, that in each one of them except the last, there had existed, either some injury of the spinal centre, as in O'Bannon's case, or some cause of *constant peripheral irritation* at the penis, as stricture, phimosis, etc., for the entire period during which the genesis of uric acid nuclei¹ had been continued. With this pertinent remark, we ask for the present to defer the discussion of these significant cases, *till we can examine*

¹ There is no question as to the vastly greater frequency of *uric acid*, as forming idiogenic nuclei, as compared with all the other forms put together. "If we take into account," says G. Owen Rees, "all the calculi of which the lithic acid or its compounds form the nucleus, the proportion of calculi originating with this principle (and which probably would otherwise not have been formed), is very much greater." He then examines carefully the proportions of uric acid nuclei as found in the specimens in various hospitals; Bartholomew's, Guy's, Norwich, Manchester, Bristol; the hospitals in Suabia and in Copenhagen. And he finally remarks: "The relative proportion of all the calculi originating in some form or combination of lithic acid, in all the different collections, is nearly as 1 : 1½, which is equal to saying that, if a lithic acid nucleus had not been formed and detained in the bladder, two persons at least out of three who now suffer from calculus, would have never been troubled with that affection."—*Cyclopædia Anatomy and Physiology*, Article "Urine."

them in connection with others, constituting a large class, which we think can be made, even still more clearly to illustrate the reflex excito-secretory or "excito-vasomotor" pathogeny of such idio-genic nuclei.

LITHOTOMY IN THE FEMALE—VAGINO-VESICAL INCISION—REMOVAL BY DILATATION.

It is by no means difficult for the experienced practitioner to accept the causes assigned in systematic works for the remarkable difference in the frequency of calculus in the male and female. Like all other diseases—common, but in a different degree, to the two sexes—the greatly less exposed condition of the female to the general causes which are supposed to favor the occurrence of renal and vesical derangements, would go far to account for the comparative immunity of the female from the origination of nuclei in her urinary passages and cavities. However this may be, there are conditions universally recognized as pertaining to the female which are undoubtedly, beyond all comparison, the cause of the almost entire freedom of the sex from the distresses of vesical calculus—the shortness, dilatability, and directness of the urethra, together with, perhaps, the chances of flushing out the stone in the greater and more frequent distension of the bladder, incident to greater pelvic amplitude.

Many circumstances seem to indicate that while detention of the nucleus is the indispensable condition of vesical calculus, this detention is, even in the male subject, not the invariable, or perhaps the most common result attending the formation of small concretions in the bladder or kidney. It is probable that there are comparatively but few, even in the male, that are detained and become too large for exit by the urethra. How invariable is the expectation, and how seldom is there disappointment, in finding "the gravel pass out" after attacks of "nephritic colic." The case quoted from Vincent plainly indicates that while the irritation caused by the phimosis was most probably the excitor influence, initiating the disturbance of renal secretory action, which induced the genesis of uric acid nuclei, the closeness of the orifice of the sac was the sole cause of their detention, and of the accretion upon them to form the preputial calculi. In the same way the injury of the young boy's penis by the kick of the horse, giving rise to paralysis of the vesical sphincter, and probably modifying renal secretory action, would not have

resulted in the vast accumulation of calculi in the urethra, but for the retentive yoke which he wore to prevent incontinence. But for such obstructions, these vast numbers of calculi would never have been found, or perhaps never known to exist, their nuclei having passed out unobserved. For these reasons, it is not surprising that the occasions are so rare, both actually and comparatively, in which the lithotomist has to record operations on the female. The vast majority of these nuclei, especially in the female, escape by the urethra very soon after entering or forming in the bladder. But in women, even after attaining considerable size, they often yet find exit, and escape being the subject of operation. This is the case, almost invariably we think, with idiogenic nuclei, but the records of lithotomy are crowded with cases which constitute the curiosities of its literature, and which are illustrative of the fact that foreign bodies large enough, or of such shape as to secure retention, invariably become incrustated with equal, if not with greater, rapidity in the female than in the male, *by the modification of secretory action which they excite*, and by the rapid precipitation to which they give rise. Vide the hairpins, bodkins, needle-cases, catheters, slate pencils, *et id omne genus*, which will be found enumerated among the xenogenic nuclei that have been found from time to time initiating calculi in the female bladder. Among our own operations, out of what we believe to be over fifty in all, we find the record of but four lithotomies upon the female subject. The following is illustrative of the tendency of calculi, of even considerable size, to escape from the female bladder.

Case XLII. Mrs. W. S. N., aged about 30 years, a resident from birth, of Burke County, Georgia, had been the subject of vesical irritation for a year or two. Her symptoms were reasonably attributed to uterine displacement and was considered as one of the attendants of hysterical excitability incident to uterine derangement. She had undergone much of the routine of measures considered warrantable in such conditions, had visited springs and resorts supposed to be beneficial in such states of health, and was finally recommended to the care of Dr. J. A. Eve of this city for the treatment of a "tumor" just within the pubic wall of the pelvis and which could be felt above the vulvar end of the vagina through its anterior coats. To the tumor various applications had been made; among them leeches had been applied several times to lessen the tenderness

and turgescence and to prevent suppuration, which at times was supposed to be impending. Finding the case entirely surgical in its nature, Dr. Eve advised that we should visit her, requesting that we make special investigation of the bladder and urethra. On inquiry we found that she had, some months ago, suffered for a time much more than her usual amount of vesical irritation. Then, at times, there was obstruction to the passage of the urine; this was quite serious for a considerable time, but never amounting to complete retention. The obstruction gradually became less and less till finally it disappeared leaving only burning in micturition and tenderness in the situation of the tumor. She had been catheterized but no stone had been detected, we do not think one had been suspected. Finding a hard resisting tumor behind the clitoris, and above the upper wall of the vagina, which, on account of considerable tenderness, was somewhat intolerant of pressure, we, not suspecting calculus, introduced a silver catheter to aid in the exploration from the bladder-side of the tumor. We had almost completed our inconclusive investigation when on pressing the tumor against the catheter, we perceived a decided grating as the instrument was withdrawn. Further examination developed the presence of a calculus. This had been arrested in the vesical end of the urethra or neck of the bladder and *pocketed* there by a dilatation of the lower wall of the canal. Being satisfied of these conditions we appointed the following day for the operation.

July 21, 1857. This lithotomy was of the simplest character. The stone must have been pocketed mostly in the urethra and partly beyond the sphincter of the bladder. The incision was therefore vagino-urethral rather than vagino-vesical. The patient having been anæsthetized by chloroform, assisted by Dr. Eve, a common grooved director was carried into the urethra with the view of making prominent the line to be incised. Finding that it did not pass easily between the stone and the urethro-vaginal wall we laid it aside and seizing the tumor between the thumb and forefinger of the left hand, a cut of nearly an inch was made directly upon the stone in the median line. The grooved director was used to somewhat loosen the calculus in its bed, and it was very readily withdrawn through the vagino-urethral incision. No sutures were required, there was little or no incontinence of urine and the wound rapidly closed, over a catheter worn for a few days, apparently by the first in-

tention. The lady returned home well within ten days. The calculus was of a dark brown color, was not tested but was probably of uric acid. It weighed about two drachms, rather light for its size, which was that of a small marble. Burke County was at that time a region strongly characterized by malarious diseases, and it is said here and there to contain calcareous solutions in the drinking-water of certain neighborhoods. We have no water-history of this particular case.

Before describing our next case of lithotomy we give the particulars of a case treated by rapid dilatation and extraction within the past two weeks while engaged on the present report. Our last case is *simply curious*, having no bearing whatever upon our course of pathologic investigation.

Removal of a Quartz Pebble by rapid dilatation. No calculous deposit remaining three years after in the bladder.

CASE XLIII. Maria Tilman, a colored woman, aged about 40 years, a resident of Augusta for the last two years, had suffered from vesical irritation for over three years, had been treated by several physicians of Augusta. We had not seen her until she was referred to us for operation by Dr. M. A. Cleckley of this city, who on examination with a sound had discovered a stone in her bladder.

We found her bladder extremely irritable, the vulva and urethra tumid and tender. She had not been able to urinate for some months without the use of a gum elastic catheter which she had learned to use herself. On introduction of the sound we at once detected the calculus, which on being struck gave out what appeared to be a peculiarly sharp ringing sound. Finding it of small size, we determined to attempt its removal by rapid dilatation.

August 18, 1876. Being sent for in haste, we found the stone, though not in the neck of the bladder, quite accessible. Assisted by Dr. A. S. Campbell, we rapidly dilated the urethra, first with a No. 12 steel bougie, then gradually up to No. 17, when by means of a dilator we were soon able to enter the index finger of the left hand to the second joint. We now introduced without trouble the smaller calculus-forceps of our lithotomy case and very readily succeeded in seizing and extracting the object, which to our surprise we found to be a quartz pebble of rather oblong proportions and an irregular cuboid in shape. It had no

deposit whatever upon it and was as clean and natural in appearance as though it had just been taken out of a stream. Being urged for an explanation the woman assures us "*it was pushed into the bladder at least three years ago*, and that she has not had a moment's peace since." It weighs sixty-eight grains.

28th. Maria still suffers from vesical irritation, though she does not have the same amount of tenesmus and "straining" as before the removal of the pebble. There is still some incontinence of urine, but she is gradually improving in this respect.

We had seized this stone with Herteloup's *brise pierre*, but for a very good reason, as has been seen, failed to crush it. The inexplicable peculiarity of the above case is, *the entire absence of deposit* on a nucleus that had remained in the bladder over three years. This is an occurrence without precedent in our experience. Can it be possible that foreign bodies of *certain materials*, silex or quartz being one of them, do not admit of calcareous precipitation upon their surface so as to constitute them the nuclei of stone? A case reported to us by a distinguished member¹ of the International Medical Congress, in which a portion of the glass tube of a thermometer failed after years' residence in the bladder to collect calcareous strata would indicate that highly polished mineral surfaces resist precipitation. We know of no way of testing the question in regard to quartz otherwise than by actual experiment or by observations rarely afforded on cases as they occur.

Removal of a small Uric Acid Calculus, by gradual dilatation, from an infant of twenty months.

The following case is among those which occurred since the numbering of our list, and adds another to the class of infant cases dating from the period of first dentition.

CASE XLIV. S.F., residence Augusta, Georgia, aged 20 months. At 15 months of age, in first dentition, the child manifested symptoms of vesical tenesmus and great irritation. No examination made, and treatment interrupted by removal to Memphis, Tennessee. Dr. D. D. Sanders, coming in charge of the case, verified the existence of calculus by the sound, and on the patient's return to Augusta referred the case to me for treatment.

Gradual dilatation by gum elastic and steel bougies was per-

¹ Dr. J. W. S. Gouley, of New York.

severed in for nearly two months. The dilatation attained being No. 18, English scale, of steel sound. The vesical irritation was unabated up to this time, but suddenly and permanently ceased on the passage one day, of a "hard dark object like a piece of bone," as reported by the nurse. This was probably a small calculus of uric acid. It was unfortunately not preserved to be inspected and tested by us. Even with the prolonged use of the large sounds, there was no failure at any time in retention of urine. The child though somewhat emaciated from irritation, became and remained perfectly comfortable from the day of the discharge of the calculus and rapidly recovered her flesh and good spirits.

Vesical Calculus in connection with Vesico-vaginal Fistula. The Calculus antedates the Fistula.

The following case illustrates the ready facility with which lithotomy vagino-vesical incisions unite as compared with the denuded edges of ordinary vesico-vaginal fistula.

CASE XLV. Mrs. R., aged about 26 years, had previously been operated on by us for vesico-vaginal fistula. Before the discharge of the patient she was found to be the subject of a calculus which had escaped detection at the time of the operation and in the previous examinations, on account probably of being pocketed in the upper portion of the bladder.

A sound was passed into the bladder through the urethra, and the vesico-vaginal septum was held steady by a tenaculum penetrating into the bladder. A short incision was made upon the end of the sound through which it protruded into the vagina. With the curved sound held in this opening, we divided the vesico-vaginal septum backwards in the median line for more than an inch, with a curved bistoury crossing the line of the cicatrix left by my operation for vesico-vaginal fistula. A stone as large as an English walnut was readily removed through this opening by the forceps. Phosphate of lime externally with uric acid nucleus.

Although Dr. Emmet, whose operation was used in the above case, regards sutures as unnecessary, nine or ten silver sutures were applied in the present instance, and the case was in its after-treatment managed as an ordinary vesico-vaginal fistula. After the removal of the sutures, in some eight or ten days, the case required but little or no attention, and Mrs. R. returned

home well, and has had no trouble with either stone or fistula since.

Mrs. R. was an extremely delicate and diminutive woman, had suffered from childhood with trouble about her bladder, and had contracted the habit of morphine-eating. As the above case was published in the first volume of *Gynæcological Transactions*,¹ we refer the reader to its fuller report in that place.

This stone was evidently in the bladder, and not detected at the time of the plastic operation: and this we believe to be the history of all calculi in such connection.

As we have written,² "such calculi do not always result, as thought by Dr. Emmet, from the closure of the fistula, but more often exist in the bladder, though not detected, at the time of the operation. They probably antedate the fistula and are instrumental in its production during the labor."

"The two practical deductions from the above interpretation of my case of vesical calculus found after fistula, are the following:—First, that careful examinations should be made for stone *previous to the closure of the fistula* in all cases in which the known circumstances attending the occurrence of the accident do not exclude the possibility of its presence in the bladder; and secondly, that all patients should, previous to discharge, be subjected to careful sounding *after the cure of the fistula*, and to distension of the bladder by urine or by the injection of water."

Vagino-vesical lithotomy—Blood-clot nucleus—Silver sutures—Recovery without fistula.

CASE XLVI. C. N., a bright mulatto woman, aged about twenty-five years, a resident of Edgefield County, South Carolina, was brought to our attention, by our friend, Dr. J. Walter Hill, of Edgefield, during a visit to that place in behalf of another patient. Our history of the case previous to the day of operation is imperfect. She had, however, suffered long from vesical irritation. Dr. Hill had been induced to explore the bladder, and with the sound detected the existence of calculus. Being kindly requested by the doctor to operate, with his assistance we performed vagino-vesical lithotomy as previously de-

¹ Origin and History of Calculi found in the Bladder after the cure of Vesico-Vaginal Fistula by Operation, p. 354.

² Loc. cit.

scribed. The incision was nearly an inch and a half. Entering the cavity of the bladder a considerable stone was grasped by the forceps which, with very little pressure, immediately crushed it into many fragments. The bladder being thoroughly cleared and afterwards deluged with water from a Mattson's syringe, we carefully closed the incision with silver sutures after the manner of Sims's operation. We think twelve or thirteen sutures were applied.

On examination of the larger fragments they were found to constitute integral portions of a hollow sphere. The interior of a portion of this sphere was indelibly stained and blackened, covered as it appeared to us with remains of blood-clot. The microscope has not been applied. From another portion of the wall of the cavity the stain was easily washed away, the surface here being convex, fitting probably against a corresponding concavity with an intervening cleft. We think that no one inspecting the fragments still in our collection, can doubt the correctness of the opinion that the calculous precipitation took place *upon a clot of blood* that had been detained in the bladder.¹ The blood seems to have afterwards dissolved leaving what appeared to be an empty but rather irregular cavity. The concretion is evidently a composite one, being partly uric acid and partly a limy phosphate. The pieces recovered weighed somewhat less than half an ounce. The stone was not tested. In the note below will be found a few references to blood-clot nuclei. Sigmoid catheters were advised in the after treatment. After the removal of the sutures at the usual time, by Dr. Hill, he found

¹ "Blood or sloughs may also form the nuclei of stone. This is, indeed, doubted by *Von Walther*, but there are stones which have cavities within them; and it is probable that the mucus of the bladder, or a similar albuminous animal substance, had at an early period filled it, and in the course of several years, had dried up. *Lisfranc* found in a urinary stone as big as the fist, a blackish nucleus of slight consistence which resembled a clot of blood, and on chemical examination, presented a fibrinous substance. *Cruveilhier* showed in the Anatomical Society at Paris a very large urinary stone, of which the nucleus was a clot of blood. *Sir Astley Cooper* (*Surgical Lectures*, Vol. II. p. 242) mentions a case in which having removed a triple phosphate stone, the disease returned, and he again performed the operation, and found a *large coagulum of blood* in the bladder, surrounded by a triple phosphate deposit."—*South's Chelius*, Vol. III. pp. 248-49. "In the College Museum," says Dr. South, "there is a stone consisting of uric acid deposited upon a hollow crust or shell of impure oxalate of lime. This crust was most probably *formed upon a clot of blood*, which has afterwards shrunk."—*Op. cit.* p. 250.

there were minute fistulæ between several of the sutures. A second communication, however, informed us that they had closed, and that his patient was perfectly well.

Though the above case has furnished the only clot-nucleus in our collection of specimens, we have shown by reference to other writers, that such cases are by no means without precedent. Persulphate of iron, should it be injected into the cavity of the bladder for vesical hemorrhage, would, from the firm and putty-like clot it produces, almost certainly furnish a blood-clot nucleus for a subsequent stone.

A large vesical calculus, dating probably from infancy, in a young woman affected with ankylosis of the lower jaw, resulting from cancrum oris in infancy—Its almost spontaneous expulsion in articulo mortis—Buccal irritation the probable source of its production.

CASE XLVII. Miss M. R., a young lady, aged about seventeen years, was a native of Barnwell District, South Carolina, but from the age perhaps of ten, had resided in Augusta. She was extremely thin, cadaverous looking, and badly developed. Had been afflicted from infancy with ankylosis of the lower jaw and distortion of the mouth with adhesions and loss of substance about the cheek, consequent upon cancrum oris. This condition had been attributed to the injudicious use of mercury in the treatment of autumnal fever. Of this, the truth is quite uncertain. Over forty years ago, quinine, even among the progressive practitioners of the South, had not become the recognized method for remittent forms of fever. Calomel was largely used as a febrifuge. Mercurial salivation may possibly have produced the deformity and disability in question. This young lady was the subject of constant irritation about the mouth—the flow of saliva was often abundant, and her unhappy appearance rendered her a constantly appealing object of pity and sympathy.

At the time of our observation of the above case, our valued friend and colleague, Dr. Lewis D. Ford, of this city, was the family physician of her friends and had been consulted by them, on the subject of certain well-marked symptoms of vesical distress which, when brought to his attention, he at once recognized as the rational symptoms of calculus. The case had been kindly referred to us by him for early examination. This had

been injudiciously deferred by the parents on account of the opposition of the young lady. About this time, we were suddenly called to visit her in what was thought to be a convulsion. Dr. Ford arriving at the same moment, it was suggested to our minds that possibly some condition in connection with the supposed calculus might have caused the attack. In her unconscious condition this important examination was quickly made. To the astonishment of both of us, a stone of very considerable size—found afterwards to weigh over an ounce—was found half-way emerged from the orifice of the urethra distending this canal enormously and pressing down like a great ball, entirely occluding the entrance of the vagina.

An incision was rapidly made through the vaginal and urethral coats and the stone extracted. Efforts were diligently made to resuscitate her, but both pulse and respiration had ceased. The supposed convulsion must have been her death-struggle under the stress and shock of passing so large a calculus in her extremely low condition. The stone consisted of alternations of uric acid and phosphate of lime.

The above case will be again referred to in connection with buccal irritation as modifying the secretory action of the liver and other organs in the production of uric acid to be excreted by the kidney, forming first the nucleus and then the successive superjacent strata which alternated with the limy layers.

PART II.

ETIOLOGY AND PATHOLOGY.

The Neuro-Dynamic Origin of Calculus—Morbid Excito-Secretory Action, the True Origin of the Calculous Diathesis—The Relations of the First and Second Periods of Dentition to the Origination of Calculus—The Relations of Malarial Fever to Idiogenic Nuclei—Malarial Glucosuria—Malarial Lithæmia.

THE foregoing summary, and more or less careful elaboration of nearly fifty cases of calculus, have, we earnestly hope, occasionally served to illustrate various and, sometimes, important principles bearing upon some of the more common and general

questions of lithology. With the view of adding our testimony to the vast amount already accumulated, we have endeavored, as far as we were able, to give full prominence and distinctness to everything affecting unsettled questions which our records might contain. We have in no case attempted presumptuously to decide any of these, but have endeavored simply to supply the data for induction and analysis by others—possibly in the present but more probably in some future time. Notwithstanding we have been all along deeply impressed with the high importance of every relation bearing upon our subject, still, from our own mind, one principal object of an interest superior to all others has never for a moment been absent; and, throughout the long and tedious pursuit the attainment of one desired end has urged on and encouraged us to the present moment. This object of deep interest to us has been THE ETIOLOGY OF CALCULUS, and the end we have hoped ultimately to attain, is some clear and acceptable, even though not entirely conclusive, result as to the Pathology, or, to speak more correctly, *the Physiology of the Calculous Diathesis*. This result, failing us elsewhere, as it has all others, we hope now, by a careful consideration of our data, to find it, at least in part, in *The Nervous System*. We shall, at all events, consider its relations thereto.

At a period long anterior to the present, when the rather vague and indefinite doctrines of "Sympathy" supplied our clearest explanation of the now common and familiar phenomena of Reflex Action, the frequently observed influence of either near or distant irritations or impressions over the urinary secretion, was constantly recognized and made the basis of many practical—and indeed, virtually truthful—inductions in both Physiology and Pathology. The abundant and limpid urine of hysteria was then, as now, the recognized result of uterine irritation; the frequent and profuse micturition under exposure of the body to cold, was also classed among sympathetic phenomena, while the exhilaration of joy, or the depression of grief or of fear, and even the impressions upon some, produced by music and by sound, as influencing "the holding of the water,"¹ owed the satisfactory rationale given them, to principles which during all that time constituted the ultimate bounds of our knowledge in regard to that large and comprehensive class

¹ SHAKESPEARE—"And others, when the bagpipe sings i' the nose, cannot contain their urine."

of phenomena we now associate together, as those resulting from excito-secretory or excito-"vaso-motor" action of the nervous system.

Derangements of the nervous system, whether central or peripheral, have for a considerable period been distinctly recognized as giving rise to modifications in the quantity of the urinary secretion and the manner of its discharge. Sir Benjamin Brodie¹ mentions various forms of irritable bladder; and among them the case of "an elderly gentleman who complained of frequent attacks of giddiness. This symptom probably arose from altered structure of the arteries of the brain, causing an imperfect state of the cerebral circulation. Not unfrequently this is attended with an irritable state of the bladder, and though the urine is of a healthy quality and the bladder free from disease, the patient is tormented with constant micturition, voiding his urine without pain, but at short intervals, and in small quantity at a time." He further remarks in regard to this subject: "Irritability of the bladder is sometimes the result of mere nervousness; of the same state of the bladder which in some individuals occasions a constant winking of the eyes or twitching of the muscles of other parts." [Chorea?]

That states of actual disease in the central organs of the nervous system have been known, for a long time, to modify, not only the mode of discharge and quantity of the urinary flow, but also, most unquestionably, its *quality* in a marked degree, we find abundant evidence in works of the best authors. Dr. Prout,² in speaking of the "mixed phosphates," makes this remark: "Among *acquired predispositions* may be mentioned enfeebled conditions of the nervous system, and more especially, the spinal nerves, from a variety of causes." "Thus injuries of the back," says he, "by concussions, blows, or other accidents, are exceedingly liable to bring on depositions of phosphates in the urine. Causes of this kind may vary indefinitely; but perhaps one of the most frequent, is a fall from a horse by which the individual has received, in connection with a general violent concussion of the spine, some local injury of the back. It is, I believe," continues he, "an old observation, that certain injuries of the back are often accompanied by alkaline urine, and Sir Benjamin Brodie informs us that he noticed the circumstance

¹ On Diseases of the Urinary Organs. Third edition, p. 95.

² Stomach and Renal Diseases. 1843, p. 225.

as early as 1807.” We would refer here to the case of one of our own patients: O’Bannon—Case XL.—lithotomized twice by Dr. Eve and once by ourself, and *continuing the elimination of mixed phosphates for thirty-nine years*, as a remarkable instance of *altered centric cerebro-spinal action* over the vaso-secretory action of the kidney.

We have thus, without any extended research, been able to present sufficient evidence that the influence of the *central* nervous system, both in its healthy and diseased conditions, has long been recognized as a feature materially modifying the secretion of the urine, as to both its quantity and elements. A number of cases could be presented¹ to illustrate the fact also,—though no such influence has been heretofore attributed to it by others—that some of the most remarkable collections of phosphatic and triple-phosphatic multiple calculi were accumulated under circumstances in which *reflected irritation* from the urethra or from the prepuce might reasonably, under our present method of interpretation, have been predicated as the rationale of the phosphatic elimination which gave rise to these collections. Dr. Prout, whose observation is always accurate, remarks, that “the most frequent exciting causes of such deposits are *local irritations* affecting for a considerable time the bladder or urethra; or, for example, any foreign substance introduced into, and producing an excitement in, that organ, including, as we have before mentioned, all sorts of calculi; in certain circumstances, the retention of a bougie or catheter in the urethra, strictures of the urethra in particular constitutions; all of which, and many similar causes, are capable of producing *in all individuals*¹ a condition of urine readily depositing the phosphates.” “The fact is,” says he, in a note, “that the foreign substance before it is or can be covered with phosphates, *sympathetically affects the system*² and *causes the urine to abound in these salts.*”

Mr. Murray Forbes, quoted on this subject, says: “In proper or healthy urine there is not, in clean vessels, a particle of the phosphates deposited—the whole of these being in perfect solution, and to the end of time, there would not be calculus from renewed applications of urine in which the phosphates do not predominate. When a foreign body gets into the bladder, if it meets not with phosphates already redundant it would operate

¹ See cases presented in remarks upon that of O’Bannon.

² The italics are ours.

by irritation, so as to *occasion*¹ redundancy. The diseases which require catheters and bougies are almost uniformly accompanied by the prevalence of phosphates *from the general and particular sympathies*² by which they are attended."

Thus have we found it advantageous, in order to corroborate the views we wish herein to present, to collect from the records of lithology a number of scattered facts illustrative of some of our own cases, which, while they have been heretofore more or less particularly mentioned by others as remarkable events in the history of some few cases of stone, have never been particularly dwelt upon, either in the relations of etiology or of pathology, except as explained by the mystical doctrines of *sympathy*.

Were such an exercise as useful as it would be pleasing, we could collect from the recorded reflections of observing writers an abundance of testimony to indicate their recognition of the instrumentality of "sympathetic agency"—as the unrecognized reflex action was then called—in favoring the infusion of alkallescent elements into the urine and their deposit upon any nu-

¹ The italics are ours.

² To understand the exact value of the term "sympathy," as held at this time, we quote the following:—

"*Sympathy*. Owing to an impression made upon one organ, distant organs become affected without our being able to refer the transmission to mechanical agency, or to the association of functions. This kind of association is called *sympathy*. A particle of snuff, or other irritant, impinging on the Schneiderian membrane, produces itching there, followed by a powerful action of the whole respiratory apparatus, established for its removal. The sneezing thus produced is not caused by the transmission of the irritation through the intermediate organs to the respiratory muscles; nor can we explain it by the mechanical or functional connections of organs. It is produced by a mode of correlation: in other words, it is a case of *sympathy*. A small wound in the foot will produce locked-jaw, without our being able to discover or to imagine any greater connection between the foot and the jaw than there is between the foot and other organs of the body. We say that it is caused by sympathy existing between those organs, and, so long as we use the terms to *signify the unknown cause of these connections* it is well. *It must be understood*, however, that we *attach no definite idea to the term*; that it is only employed to express our ignorance of the agent or its mode of action; precisely as we apply the epithet *vital* to a process which we are incapable of explaining by any physical facts or arguments."—*Human Physiology*. By Robley Dunglison, M.D., p. 433. Philadelphia, 1832.

The terms "reflex motory" and "reflex secretory action" more fully explain the *rationale* of phenomena described under the vague term of "sympathy," and which before the time of Marshall Hall were so inexplicable to our ancestors.

cleus which, for the time being, happened to be present. Our object being however that of adjusting the application of these same facts and phenomena, formerly attributed to sympathy, with others of a wider range, to more modern views of nervous physiology, we have here but briefly presented them, only by way of introducing reflex excito-secretory or vaso-motor action, as the true pathogeny of calculous concretions, and as the fundamental condition and real instrumentality by which the calculous diathesis, in whatever type it may appear, is most probably originated. With this view, we have, in the historical and physiological portions of this paper, briefly presented a distinct and concise consideration of the excito-secretory function. We can now therefore proceed to the discussion of our subject without further general remarks.

LITHOGENESIS TO BE STUDIED IN THE NUCLEUS.

As in tracing the history of an obscure word, the philologist must go back to its root; and as in determining the age of some stratum of the earth's crust, the geologist finds it advantageous to study sometimes the minute organic remains imbedded in its mass; so must the lithologist go back to *the nucleus*, to inquire of the origin and to learn the true source of the production of vesical calculus.

In the present portion of our paper we shall review briefly some of the now current and generally accepted theories of the origin and production of calculus as they have been arrived at by customary methods of investigation; and then, by a consideration more particularly of the idiogenic nuclei, endeavor to interpret rightly their significance. The hypothesis which has for the longest time maintained general confidence, is that which attributes the origin, production, and growth of vesical and renal calculi to the calcareous elements held in solution by the drinking-water of the calculous subject. The plausible ground for this wide-spread opinion has been the generally admitted fact that the largest number of calculi have been found to contain as their principal ingredients, some one or more of the salts of lime or of magnesia, the most common and frequent of these earthy salts held in solution by calcareous or what is known properly as "hard-water." And again, it has been further alleged and to a great extent acknowledged, though denied by some, that the largest number of calculi have been produced in

regions offering *hard-water* as the general beverage of the inhabitants.

These two arguments, as we could show, both from a few of our more striking cases¹ as well as from our references to the experiences of others, more particularly the well-considered conclusions of Prof. Gross,² are theories which cannot be depended on as consistent and satisfactory in accounting for the origin of calculus. For, as has been shown, calculi having alternating strata of lime and magnesia with other ingredients, or solidly composed of lime or magnesia, are often found to prevail abundantly in *free-stone regions* where there are no solutions of these salts in the drinking-water, while, on the other hand, calculous concretions of all kinds are often entirely absent, where lime and magnesian solutions are most abundant. We do not design to give here any extended discussion to this subject as it has been heretofore considered by others, and also in another portion of this paper. It has been seen that we have ever given the most careful attention to *nuclei* as the invariable and necessary *first step* in the order of calculous concretion. Whatever shall be proved in any given calculus or in any number of calculi, to be the constituent of the nucleus, we must be guided by the physical or chemical character of that constituent to the source of the nucleus; and whatever shall be proved to be the most common constituent of all nuclei, will lead us infallibly to the most frequent source and origin of all calculi. Hence the value of the method of tracing the history of the calculus *back to its nucleus*, in order to determine by *its* material the source also of its origination. Studying the history of calculi after this method may lead us to more reliable and sometimes to most unexpected results. By it, in a large majority of calculi—more than five-sixths—we are at once led to exclude lime and magnesia and all other earthy ingredients from the initial stage at least of lithogenesis.

Nearly all idiogenic nuclei can be shown by the abundant testimony of every one who has given intelligent attention to the subject, to be composed of materials into which neither lime nor magnesia enters as an ingredient. In their stead we have, first, and most frequently of all, uric acid; then, successively, cystin, xanthin, plastic mucus and other organic products elimi-

¹ Cases XXXVIII., XXXIX., and XL.

² Urinary Organs.

nated from the blood or mucous membrane of the urinary passages, under some aberration of healthy action or morbid disturbance.

The irritation of calculus then—that is, of the idiogenic or self-originating nucleus—is chemically characterized by an acid constitution of the urine and most probably of the blood, and reasonably is not the *outcome* of such alkalescent ingredients as are supposed to be supplied to the blood and urine by any infusion of the earthy salts taken in the drinking-water of the subject. Taking this strictly chemical view of the conditions known to favor redundancies of uric acid in the blood and in the urine,¹ whatever may be the acknowledged agency of lime and its salts in favoring the rapid and extended growth of the stone *after the entrance of the nucleus into the bladder*, we might almost feel inclined to adopt the opinion of the distinguished medical officer of health for London, Dr. Letheby, and decide that, “because of the lime these hard-waters hold in solution, they *remove acid matters* from the blood and thus act as a grateful medicine to the system,” and—as we add—they therefore rather *prevent* stone than produce it, by neutralizing and decomposing the uric acid in its process of nuclear agglomeration.

We could here particularly dwell upon the phenomena of some two or three of our cases heretofore mentioned, to show that alkaline solutions, whether as medicines or as common drinks, are greatly instrumental in the disintegration and removal of even very considerable uric acid formations.²

Whatever, then, we might suppose would be calculated to lessen or neutralize the superabundance of uric acid in the fluids of the body, and in the urine especially, must lessen, or at least *not favor*, the liability to uric acid nuclei; and in the same proportion as the uric acid nucleus is more frequent than other nuclei will it lessen the liability to calculus. It is well known that the correction of uric acid deposits, amorphous or concrete, has been *by alkalies*, liquor potassæ being most frequently found effectual.

¹ In healthy human urine uric acid seldom exceeds 1 part to the 1000.—Lehman. Almost the only urine in which uric acid is not to be found is in that of the herbivora. In these animals it is found only during the period in which the young is sustained by the milk of the dam. The urine of the calf is abounding in uric acid. The solid urine of serpents is composed almost entirely of uric acid.—*Harley*.

² See Cases XXXIV., XXXV., XXXVI.

Our own observations, then, of nearly fifty cases of calculus with idiogenic nuclei, as well as our own researches into the recorded experience of others, bear us out in the assertion that, *by an incomparable proportion*, autogenic calculi, both renal and vesical, whatever may be the composition of their external strata, whether continuing throughout as uric acid or composed of one or more of the salts of lime, as phosphate, carbonate, oxalate, or of these salts of lime in combination with magnesia or ammonia or triplicated with both—we repeat, they out of all proportion—have been found to have their idiogenic beginning in some minute agglomeration of *uric acid*. This of course was most reasonably due to aberrated secretory action of the liver (though excreted by the kidneys), or perhaps it may be more acceptably said, of some portion of the digestive apparatus—or in a less frequent proportion—due to some agglomeration of mucus or of other plastic material, the existence of which in the urinary passages, no less than the excess of uric acid, indicates disturbed or aberrated secretory action in the bloodvessels and surfaces of those passages.

HISTORY OF THE IDIOGENIC NUCLEUS.

The origin of the uric acid nucleus, almost invariably found to constitute the initial stage of calculous concretion, becomes in the present investigation an object of much interest. The kidney itself, the spleen and the liver have each been variously charged with supplying to the urine solutions of this ingredient, so often crystallizing into nuclei to form the basis for the precipitation of calculous matter. In a subsequent portion of this paper we have pointed out, in the case of the infant and of the child, the most frequent subjects for the origination of stone, the rationale and also the neuro-dynamic instrumentalities by which the functional derangement necessary to the production of uric acid in the liver and other organs can be brought about. We were intending further to trace to the end the chemical processes by which our all-important object of study, the resultant nucleus, is perfected. This most gladly do we find to be unnecessary; a far more astute thinker and an abler pen has been engaged with this portion of our subject, and most pertinently do we find the *chemistry* already written out to our hand, albeit its relations to infancy and childhood and its neuropathic bearings are nowhere even glanced at. “I need not remind an audience such as that

which I have the honor to address," says Sir Charles Murchison,¹ "that deposits in the urine of lithic acid or lithates are not due to any morbid condition of the kidneys; what I wish to insist upon is, that the frequent occurrence of these deposits in the urine ought always to be regarded as a sign of functional derangement of the liver arising from causes, sometimes temporary, at other times more or less permanent, . . . and that lithuria, like glycosuria, is very often due to functional disease of the liver, although even glycosuria is still ranged in some text-books with albuminuria and diseases of the kidneys." "In other words," he continues, "abnormal disintegration of albuminous matter in the liver may lead to a morbid condition of the blood and of the entire system which often manifests itself in lithuria. This morbid state of the blood I propose to designate lithæmia." The ultimate chemical result as shown by him is, that "the normal process by which albuminous matter becomes disintegrated in the liver into urea is deranged, and it is discharged by the kidneys in the less oxidized form of lithic acid and its salts."

As an unavoidable corollary of his discussion, Murchison decides at once that most urinary calculi have their origin in the excess of uric acid produced by the deranged liver, and even where other products, as cystin, xanthin and oxalate of lime, form the basis of the concretion, he still insists that "the imperfect oxidation and disintegration of albuminous matters in the liver is the common origin of them all." As will be seen hereafter, the functional disturbances in the liver, intestinal canal, and urinary apparatus, resulting from reflected dental irritation, taken in connection with the albuminous food of the infant, present very strong claims as a neuro-dynamic factor in accounting for the preponderance of calculus in the early periods of life.

Having thus traced the history of the idiogenic nucleus from its production in the liver to its agglomeration in the urinary passages, we may now consider the neurodynamic influences which promote the precipitation of calcareous strata upon it, and also upon the xenogenic nucleus, which influences, it is scarcely necessary to state, are the same in either case.

¹ On Functional Derangements of the Liver. Being the Croonian Lectures delivered at the Royal College of Physicians in March, 1874, p. 64.

CALCULOUS PRECIPITATION UPON THE NUCLEUS.

In regard to xenogenic or foreign nuclei, our course of reasoning must be different, the process being more simple and the history long recognized¹ and less obscure. Indeed, the reflex-secretory process set in action *after* the entrance of a uric acid nucleus or of some rarer form of idiogenic nucleus, as cystin, xanthin, mucus, etc., into the bladder, is identical in its subsequent history with that of the minie-ball, the bone-fragment, the bougie, the "needle-case," or that of any other extraneous body which is to form a nucleus. The *dominant centre* of the aberrated secretory process seems now to be changed, together with the excitor surface upon which the irritation is made, and, for this or some other reason, the character of the resultant product too is now almost invariably changed; instead of acid urine, it is now most frequently alkaline, and instead of the crystallizations of uric acid, which very rarely continues, upon the central nucleus, we have the solid product and results of alkaline precipitation in the form of oxalates, carbonates, or phosphates either of lime or of magnesia, or of ammonia in double or triple combinations.

Of course we do not attempt even to define what are these combinations, much less do we undertake—nor do we think we should be asked—to account for their variety or their changes. The scientific and practical chemist is every day surprised at the development of unexpected affinities, and perplexed in endeavoring to account for them: how much more inscrutable must be the affinities in that vital laboratory in which, as yet little understood, neurodynamic influences govern and probably pervert, to a certain extent, the physical laws by which chemical phenomena are ordinarily interpreted.

We would, however, here again gladly call attention to the facts presented by some of our own cases and others that might be quoted in relation with them, to prove that the vast elimination and rapid accumulation of the earthly materials resulting from such reflected irritations did not appear to depend at all

¹ The phenomena of this process, as we have already seen, has long been understood and has been amply accounted for under the doctrines of *sympathy*—which has been fully shown, when translated in the clearer light of modern discovery, to mean *reflex nervous action*. The phenomena were quite familiar and the process of action known, but the instrumentalities had not been clearly recognized, nor their rationale, until the time of Marshall Hall.

upon calcareous matters taken with the food or the drink. One of our patients with the bone-nucleus resided in a region in which slight deposits of lime are here and there found in the soil, though none ever in the water. Another, with the minie-ball nucleus, lived in a region where there is absolutely no lime nor magnesia either in the water or the soil. The bone-nucleus accumulated in four years and one month, one ounce and one drachm of ammonio-magnesian phosphate, while private Griffiss, in about the same time, four years and four months, accumulated on the fragments of lead four ounces and four drachms avoirdupois of what has been decided to be triple phosphates. The other concomitant circumstances between the two patients differed very little in essential particulars.

In the absence of any experiments bearing upon the subject that we have time at this moment to refer to, we will venture to state that from our careful study of our own cases of stone and of those of others as they have occurred in persons affected with diseased lumbar or possibly dorsal spinal centres, or in persons with irritating vesical nuclei centripetally impressing spinal centres, and from the analysis of the urine of partially paraplegic patients, we have formed the opinion that irritations in this region of the spinal cord, whether centric or reflected from the bladder or genital organs, by phymosis, stricture, stone, or enlarged prostate, is nearly always attended by *an alkalescent state of the urine*, and often by amorphous or concrete deposits. Are these phenomena not due to the disturbed or disconcerted action of the spinal centres, or as some would explain it, to the loss of that *inhibitory power* in the centres by which ordinarily the alkalescence and the concretions are prevented?

There is no doubt that in some cases of multiple calculi the continued production of uric acid nuclei, possibly under certain influences to be described hereafter, though a phosphatic elimination is going on, yet on the principle of *alternations* in strata, the issue of new uric acid nuclei is still made at certain periods by the secretory apparatus of the liver and kidney.¹ This combination of diathesis as shown by these nuclei and also by the

¹ Or elsewhere. Dr. Harley seems decided that though the kidney may excrete uric acid it does not form it, and suggests the *spleen*. For our purposes the question is unimportant—reflex vaso-secretory action initiating and continuing the process. According to Murchison, as we have seen, the liver is the unquestionable source of uric acid.

attending strata, it is candidly admitted, has ever been to us difficult of explanation, not only on the basis of our own method of studying this production of stone, but on that of any and of every *other* method. Systematic works on urology explain what they call transitions of diathesis¹ very imperfectly indeed, so far as we can see, by a bare statement of the facts in a circle.

That we have thus far somewhat carefully considered the general influence of the nervous system in modifications of the urinary secretion and its instrumentality in favoring by direct centric influence, as well as by reflex-secretory action, the elimination of both nuclear and calculous materials from the blood, and thus favoring the formation of deposits in the urinary passages—is, we think, quite apparent. In the large class of cases which we have now to investigate, the study of reflex excito-secretory, or vaso-motor action, as an instrumentality in the origination of calculus, can be pursued under conditions and after a method not clearly applicable to the foregoing cases, which cases, however, it will serve, as we think, very greatly to elucidate.

REFLEX EXCITO-SECRETORY ACTION, AS OPERATIVE DURING THE FIRST AND SECOND DENTITION OF INFANCY AND CHILDHOOD, THE TRUE CAUSE OF THE PREVALENCE OF CALCULUS DURING THOSE PERIODS.

Of all the applications that can be made of the excito-secretory function in the elucidation of disease, the study of its profound influence as connected with lithogenesis in infancy and childhood is the one most hopeful and inviting still left to the pathologist.

In the reported experience of the large majority of surgeons the number of children and of young persons, under fifteen years of age, operated on for stone is quite remarkable. On an average, we have no doubt, much more than half the cases would come under the above-named period of life. In one of his lists Dr. Gross mentions that “over one-half were children.” It will be seen that this is the proportion in our own operations. Dr. Dudley’s cases were three-fourths children, while the largest proportion of children given we believe by any author, is that of Dr. De Roos, of St. Petersburg, Russia. Of four hundred and sixty-nine cases operated on at St. Mary’s Hospital at Moscow, *all were children* except seventy-seven.²

¹ Prout, p. 79.

² By Dr. Gross, from Gazette Médicale de Paris, Dec. 2, 1838.

“In attempting to form a correct estimate of the relative frequency,” says Dr. Gross,¹ “of calculous complaints in children, adults, and old persons, we must not lose sight of the fact that many of the cases which fall into the hands of the surgeon are examples of long standing, extending perhaps through a period of many years. It often happens that a youth of fifteen is cut for a stone developed in infancy, and a person of twenty-five may have carried a calculus since ten.” Though the above very large proportion of children, as compared with adults affected with calculus, can be shown, it is somewhat remarkable, and as we hope to show *significant*, that so very small a proportion of these are found to occur *before the age of twelve months*. “It is a singular fact,” continues Dr. Gross, “that of *six thousand and forty-two* cases not more than three occurred before the end of the first year. By far the largest number occurred within the first ten years.” So remarkable an exhibition of the prevalence of a particular period of life in an affection not heretofore regarded by any means as especially an infantile disease, should certainly at once arrest our attention, and having done so, it cannot fail to evoke diligent investigation as to the causes determining so large a majority of subjects of this particular age to that affection. We are not aware that any inquiry into this relation of our subject has ever as yet been made.

Were we, on the recognition of the bare coincidence of this period of *greatest prevalence of calculus* with the highest activity of that important physiological but highly irritative process of infantile life known as the *process of dentition*, to state that an etiological relation of the most influential character subsisted between the two events, we might very properly be answered, that mere simultaneousness of occurrence is by no means a sufficient ground to establish *causal relations* of such grave and significant importance. Let us therefore present as briefly as possible some rational grounds as the foundation for such an opinion.

THE RATIONALE OF THE FIRST AND SECOND DENTITION IN THE CALCULOUS FORMATIONS OF CHILDREN.

The process of evolution which is involved in the full development of the early teeth and of that portion of the upper and lower jaws intended for their firm and permanent accommoda-

¹ “Urinary Organs.”

tion, that they may answer the exigencies of after life—though interrupted by a time in which perhaps no active changes are obvious—is admitted by most observers to occupy more or less completely a period of over seven years. During two stages of this time, from about the 8th to the 30th month, and less markedly from the sixth to the end of the seventh year, an active process of growth and development is in process. In the first dentition, especially the attendant local irritation and general excitability of the child's nervous system are too obvious to require scarcely a remark. The gums are swollen and tender, the buccal membrane often hot and dry, or the salivary secretion may be excessive. There is a disposition to relieve the local irritation by pressure on the gums, there is general restlessness and excitability, which, it is well known, often, by reflex motory transmission through the spinal centres to the muscles, become exaggerated into violent and dangerous convulsions.

Besides these manifestations of reflex excitability in the cerebro-spinal system, it has also been shown that reflex agencies are at work to modify the vaso secretory innervation of almost the entire body. The most marked derangements have been shown to exist in the chylopoetic viscera, the liver, especially the stomach and the intestinal canal, manifest the most obvious derangements, and diarrhœa and cholera infantum have for their synonyme the word “teething” to express them. As we have just said the kidneys and bladder do not escape, but also become deeply involved in the general exaggeration of reflex vaso-secretory action propagated through the spinal centres by dental irritation.

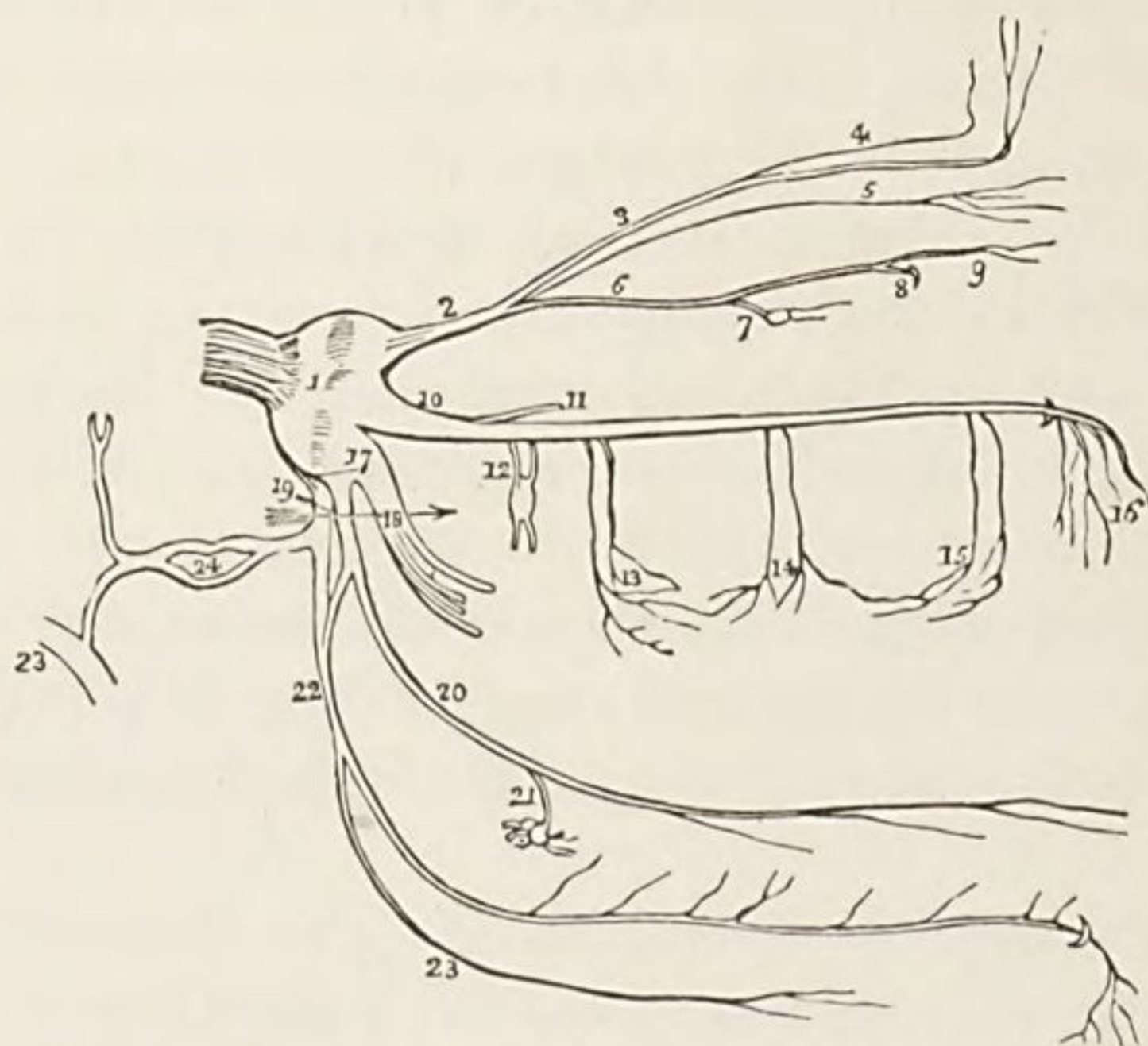
The phenomena of the second dentition, though of a less marked and distressing character, we hope to show hereafter are indicative of important results in other portions of the system.

Having occasion to investigate, as early as 1850,¹ the reflex secretory relations of dentition to cholera infantum, our attention was at that time particularly called to the frequent occurrence of the marked disturbances in the action of the urinary organs in children passing through the process of dentition; profuse diuresis, sometimes dysuria, occasionally hæmaturia, and nearly always at some period great vesical irritability with tenesmus and the passing of vesical mucus, were some of the

¹ An Essay on The Influence of Dentition in Producing Disease.—*Southern Med. and Surg. Journal*, June, 1850.

manifestations of such disturbance observed by us as not unusual concomitants of this process. Referring to writers upon the subject we found that Hunter,¹ Underwood,² Laycock, and Bingham, had made reference to the phenomena, each corroborating our observations of these phenomena attendant upon the teething process so far as the bladder and kidney were concerned; "The growth of the teeth," says Dr. Laycock,³ "is accompanied by an increased flow of urine, by symptoms of gonorrhœa and of stone in the bladder, and by involuntary micturition." No attempt, however, was made by any of these authors to describe the avenues and connections through which the transmission of dental irritation could be propagated to the kidneys and bladder, the organs affected by the vascular and secretory disturbance. These we have distinctly defined to be: 1st. The dental branches of the fifth pair, or trifacial nerves; 2d. The medulla oblongata

Fig. 6.



THE BRANCHES OF THE FIFTH NERVE.—1. The Gasserian ganglion. 2. The ophthalmic nerve. 3. The frontal nerve. 4. Its supra-trochlear branch. 5. The lachrymal nerve. 6. The nasal nerve. 7. Its branch of communication with the ciliary ganglion. 8. The passage of the nerve through the anterior ethmoidal foramen. 9. The infra-trochlear nerve. 10. The superior maxillary nerve. 11. Its orbital branch. 12. The branches of communication with Meckel's ganglion. 13. The posterior dental branches. 14. Middle dental branches. 15. The anterior dental branches. 16. The infra-orbital branches. 17. The inferior maxillary nerve. 18. Its external or muscular division. 19. The internal division of the inferior maxillary nerve. The arrow marks the separation of these two divisions of the nerve by the external pterygoid muscle. 20. The gustatory nerve. 21. The branch of communication with the submaxillary ganglion. 22. The inferior dental nerve, arising by two roots. 23. Its mylo-hyoidean branch. 24. The auricular nerve. 25. Its branch of communication with the facial nerve.

¹ The Natural History of the Human Teeth, p. 234.

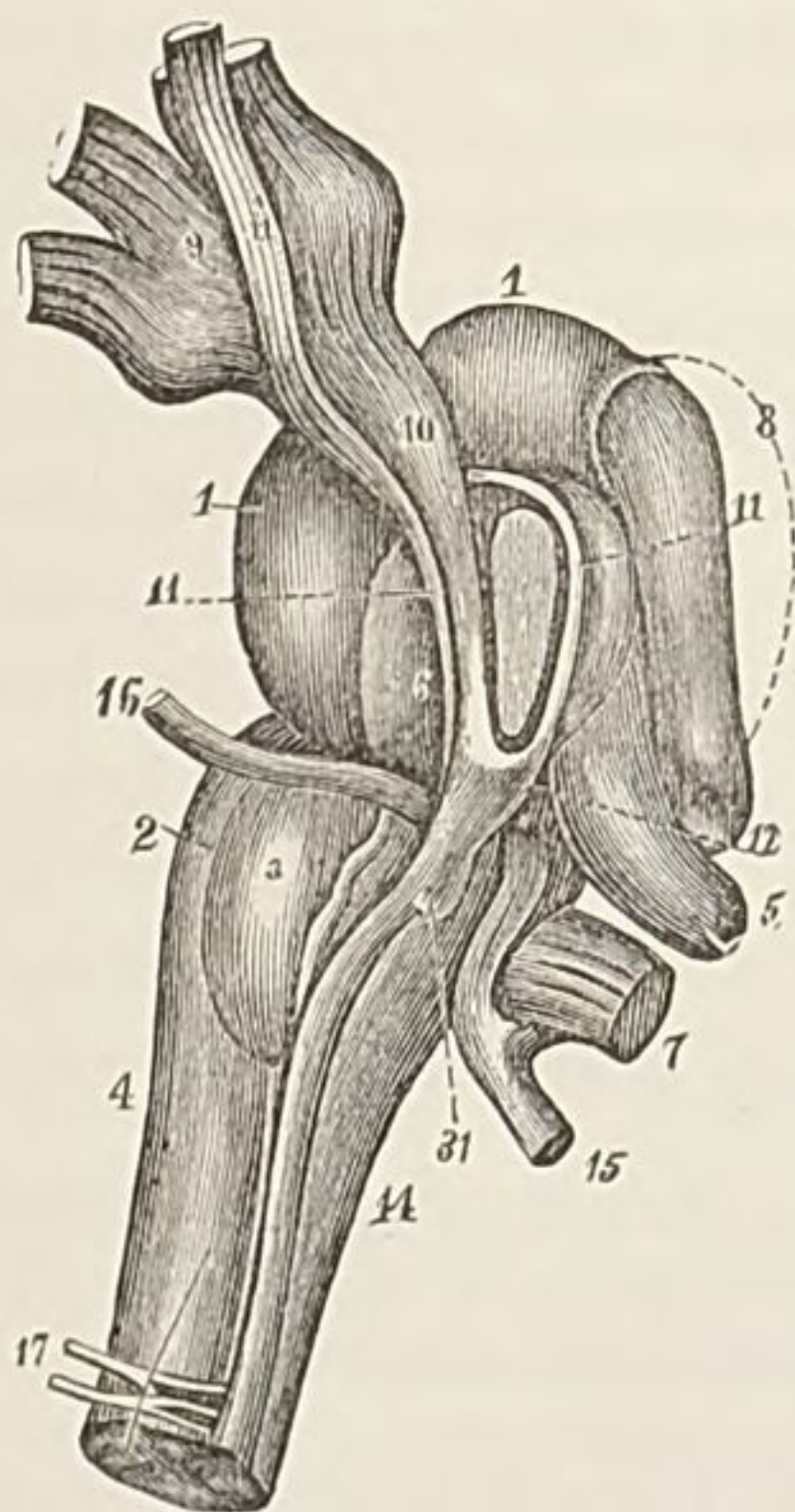
² On Diseases of Children. Ninth edition, edited by Marshall Hall, p. 252.

³ Essay on Hysteria, p. 86. American edition. Philadelphia, 1840.

where it receives the central extremity of the sensory division of this nerve, under the floor of the fourth ventricle; and lastly, the ganglia, their roots and branches of distribution, through the vesical and renal plexuses of the sympathetic, to the vessels and secretory glands and surfaces of the liver, kidneys, and bladder.

In order to present clearly to the reader every portion of the nervous apparatus utilized as the instrumentalities of the reflex vaso-secretory process, which we claim is the direct agency through which the liver principally, and perhaps other digestive organs in the first and second dentition, are excited to furnish materials for the temporary lithic or uric acid diathesis—so abundantly productive of idiogenic nuclei and therefore of the calculi of this early period of life—we here introduce from a systematic work¹ a representation of the sensory portion of the trifacial with its upper and lower dental branches, together with the references (Fig. 6). The foregoing outline exhibits almost

Fig. 7.



LATERAL VIEW OF THE PONS, SPINAL BULB, AND COURSE OF THE FIFTH NERVE IN MAN.—1. Pons Varolii. 2. Spinal bulb. 3. Olivary body. 4. Spinal cord. 5. Superior peduncle of cerebellum. 6. Cut surfaces of middle cerebellum. 7. Inferior peduncle of cerebellum. 8. Cut surface of crus cerebri. 9. Ganglion of fifth nerve reversed. 10. Ganglionic portion of the nerve. 11. Non-ganglionic portion of fifth nerve. 11'. Roots of non-ganglionic portion. 12. Eminence at the insertion of both portions of the fifth nerve. 13. Fasciculus to anterior column of spinal cord. 14. Fasciculus to posterior column. 15. Auditory nerve. 16. Portio dura. 17. Posterior roots of superior cervical nerves.

¹ Wilson's Dissector, p. 177

the entire receptive and centripetal portions of the apparatus concerned in this process. The dental filaments in both the upper and lower jaw, emanating from the structures surrounding, and concerned in, the active capillary and vaso-trophic processes subsidiary to the development of the young teeth, join directly the main trunk of each maxillary nerve, the fibres of each of which, passing through the Gasserian ganglion, unite to form the combined trunk represented as abruptly truncated on the left of this body.

The continuation of the trunk of the sensory portion of the trifacial into the posterior columns of the medulla, *which form the floor of the fourth ventricle*, is fully illustrated by Fig. 7, from Todd, representing "the central connections of the fifth pair."

By this direct implantation¹ the sensory trunk of the trifacial is brought into intimate excitor relations with the three several elements of the cord—so clearly differentiated and distinctly appropriated by Jacobouwitsch to motion, sensation, and secretion—thus adapting it, by its actual physical connections with each class of these cells, to become the reflex excitor to any one of these classes of cells or to all of them combined. The mere anatomical and mechanical connection of the sensory fibres of the fifth pair to the medulla oblongata, the admitted teleological relations of the several kinds of cells composing its elements, and the various efferent nervous distributions issuing from its ganglia, all intimately related, as we have said, with efferent fibres of this sensory portion, would indicate plainly the widespread influence it is capable of exercising even had no experimental demonstration been made to give unquestionable verification to the fact. This last convincing evidence has, however, been most satisfactorily and abundantly supplied.

¹ It is scarcely necessary to remark upon this origin here given of the sensory portion of the trigeminus. It is that traced by Dr. Alcock, of Dublin, and given in *The Cyclopædia of Anatomy and Physiology* as the result of his dissections, and it confirms the statement of Sœmmering, that it appears to arise *almost from the very floor of the fourth ventricle*. Erasmus Wilson adopts it, and Herbert Mayo has verified it. Dr. R. B. Todd says (*Physiological Anatomy of Brain and Cord*): "The ordinary columns are seen distinctly in their ascent to the brain *in the floor of the fourth ventricle*, as two cylinders [see our Fig. 8, A and F] *which form the floor of the fourth ventricle*." It is, perhaps, more properly stated by Alcock, as being *beneath* the floor of the fourth ventricle. We are thus particular, as the exact relation of its origin to the centric nervous matter has a bearing upon the identity of its behavior, under dental irritation, with the experimental results obtained by Claude Bernard.

Some time in 1852 M. Claude Bernard, of Paris, performed certain experiments to determine the influence of the galvanization of certain nerves upon the secretory functions of various organs. Having abandoned these, he next instituted others, which more recently we find clearly and satisfactorily illustrated in his lectures delivered at the College of France during the sessions of 1854 and 1855, and published in Paris, 1855 and 1856.¹ These brilliant experiments, as we have before said, have won for M. Bernard a well-earned and enduring fame and have done much towards the advancement of physiological science. Begun two years after the publication of our views in regard to the reflex excito-secretory influence of dentition through the fifth nerve on the secretions of the liver, intestines, kidney, and other organs, and not published till fully five years after, they yet afford the most singularly accurate demonstration and verification of their truth in every particular.² These experiments consisted in mechanical irritations, applied by means of delicate, pointed instruments, to the nerve-centres and cords in the fourth ventricle at the point, as will be seen, of implantation of the sensory trunk of the fifth nerve. The following description shows how exactly the experimental results, as obtained in the case of animals, correspond with the results attributed some years before to the same source, from the observation of the effect of

¹ Leçons de Physiologie Experimentale, etc.

² The following are our own contributions on Reflex Secretory Action:—

1st. "The Influence of Dentition in Producing Disease." Read before the Medical Society of Augusta, May 2d, 1850.—*Southern Medical and Surgical Journal*, June, 1850.

2d. "The Sympathetic Nerve in Reflex Phenomena—A Question of Priority of Announcement with M. Claude Bernard."—*Transactions of the American Medical Association*, May 5th, 1852, Vol. VI., p. 49.

3d. "A Claim of Priority in the Discovery and Naming of the Excito-Secretory System of Nerves—A Letter to Dr. Marshall Hall, of London," March 2d, 1857.—*Southern Medical and Surgical Journal*, March, 1857, and *London Lancet*, May 2d, 1857.

4th. "The Excito-Secretory System of Nerves. Its Relations to Physiology and Pathology."—Prize Essay of the American Medical Association.—*Transactions*, Vol. X., May, 1857.

5th. "Meckel's Ganglion."—*Southern Med. and Surg. Journal*, Feb. 1858.

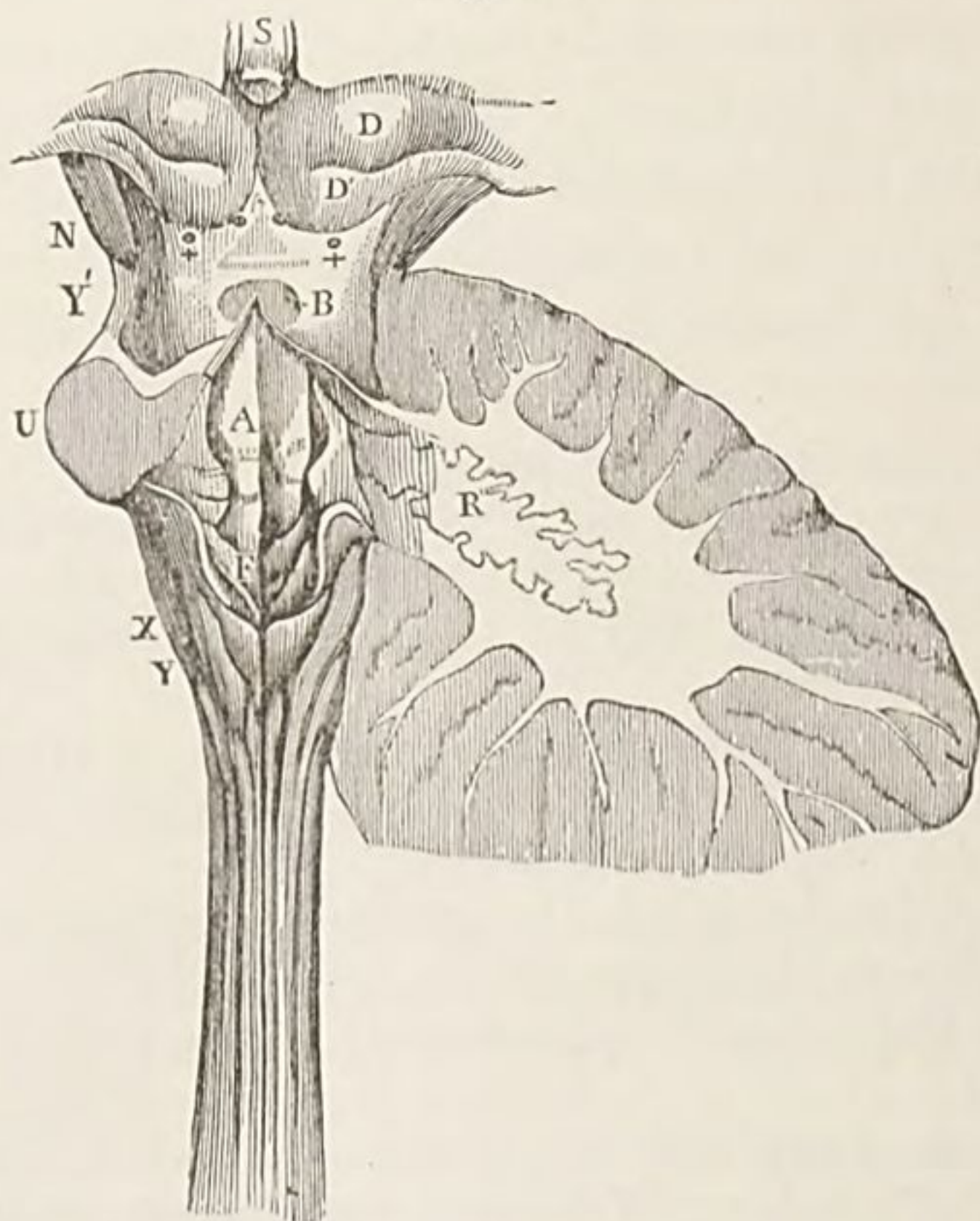
6th. "Classification of Febrile Diseases by the Nervous System."—*Transactions of the Amer. Med. Association*, Vol. X., 1857.

7th. "The Nervous System in Febrile Diseases and the Classification of Fevers by the Nervous System."—*Transactions of the Amer. Med. Association*, Vol. XI., p. 551, May, 1858.

morbid irritation in the same organs of the child under the influence of dentition.

"We find," says a cotemporary writer,¹ "minute details regarding the mode in which Bernard performs his celebrated experiment of inducing *artificial diabetes* by pricking a certain point of the *medulla oblongata* either of an herbivorous or a carnivorous animal; but until we read these lectures we were not aware that he had extended his experiment in the manner described in the following paragraph: "When we prick the mesial line of the floor of the fourth ventricle in the exact centre of the space between the origins of the auditory and pneumogastric nerves, we at the same time produce an exaggeration of the hepatic (saccharine) and *renal secretions*; if the puncture be effected a little higher we very often only produce an augmentation in the *quantity* of the urine, when this frequently becomes charged with albuminous matters; while if the puncture be

Fig. 8.



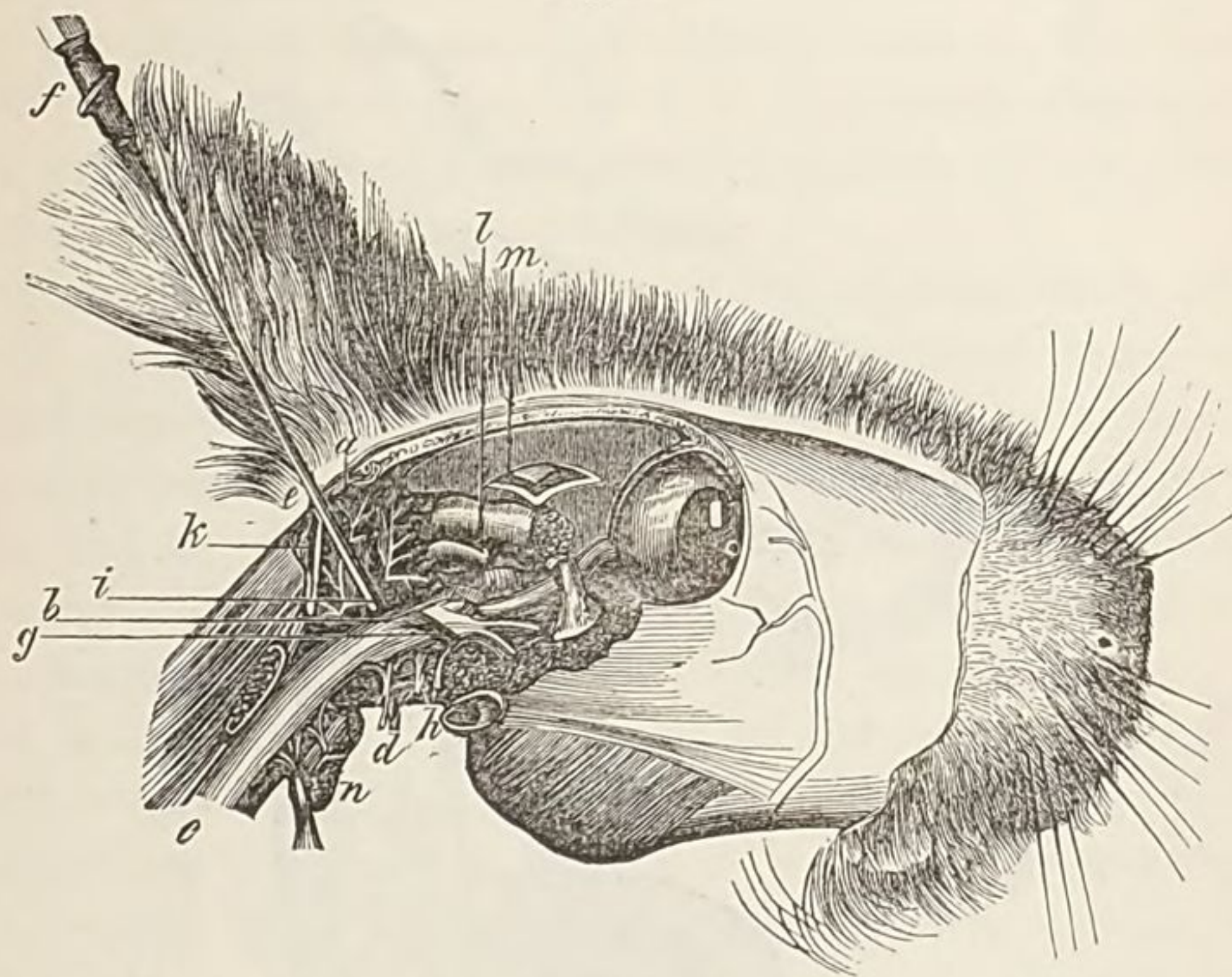
POSTERIOR VIEW OF THE MEDULLA OBLONGATA, WITH MESOCEPHALE AND PART OF CEREBELLUM OF AN INFANT.—S. Pineal gland D. Nates. D'. Testes. ++. Points of emergence of fourth pair of nerves. Y. Posterior pyramids. X. Restiform columns. A, F. Floor of the fourth ventricle, formed by the olivary column, the fissure between which is the calamus scriptorius. Y'. Posterior surface of mesocephale. B. Valve of Vieussens. N. Anterior surface of crus cerebri. R. Corpus dentatum or rhomboideum.

¹ British and Foreign Medico-Chirurgical Review, January, 1857, p. 32.

below the indicated point, the discharge of sugar alone is observed, and the urine remains *turbid* and scanty." Fig. 8, from Foville, exhibits the floor of the fourth ventricle.

It will be seen by examination of Fig. 9, from Bernard, that the

Fig. 9.



SECTION OF A RABBIT'S HEAD TO SHOW THE DIRECTION OF THE PERFORATION. *a.* Cerebellum. *b.* Origin of the seventh pair of nerves. *c.* Spinal marrow. *d.* Origin of the pneumogastric nerve. *e.* Orifice by which the instrument enters the cranium. *f.* Instrument. *g.* Fifth pair of nerves. *h.* Auditory canal. *i.* Extremity of the instrument reaching the medulla after traversing the cerebellum. *k.* Occipital venous sinus. *l.* Tubercula quadrigemina. *m.* Cerebrum. *n.* Section of the atlas.

place indicated for introducing the point *i* of the piercing instrument *f*, in order to increase the secretion of urine and to change its character, is very near the implantation of the root of the fifth pair of nerves, *g*. Hence we may say that this operation illustrates, as perfectly as any artificial measure possibly can, in the irritation produced and the results obtained, the more gradual and permanent effect of this persistent and long-continued dental irritation constantly transmitted during months of vasotrophic excitement, from the peripheral dental filaments through the trigeminal trunk to the floor of the fourth ventricle. This irritation is thence reflected, under the special influence of the ganglionar cells of Jacobowistch most probably, directly by avenues histologically and functionally congenial, viz., the secretory ganglia and trunk of the splanchnic and finally the distributed branches of the sympathetic, in the coats of the bloodvessels and

To show at one glance these latter avenues for the transmission of reflex vaso-secretory irritation, whether experimentally produced on the nerve-centre at the floor of the fourth ventricle or by a less direct process, viz., the vaso-trophic irritation—long protracted, often varying, and perhaps sometimes gradually increasing—established at the distant peripheral ends of the dental branches of the centripetal trigeminus by the development of teeth, either in the first or in the second dentition, we present the following excellent dissection (Fig. 10) from the published lectures of M. Claude Bernard.

By a careful inspection of the above delineation it will be apparent that all the nervous instrumentalities, down to the minutest distribution of ultimate filaments to the vascular structures of the secretory organs, are accurately adjusted to carry out the last step in the modification of the hepatic and urinary secretion, both as to their quantity and elements. Whether with those who believe that the superinduced excess of uric acid is formed in the kidney or, with Harley, in the spleen, or, as is most probable, with Murchison, in the liver, the appropriate plexuses accompanying the larger vessels of each of these organs are here seen to supply the filaments for the transmission of the distant dental irritation which initiated, as the first step, the vaso-secretory action underlying and originating the lithogenic process; hence the idiogenic nucleus upon which precipitation is to gather in the formation of calculi.

In connection with the consideration of infantile and puerile production of stone under trigeminal irritation of first and second dentition, we will here remark upon one of our cases, which we think may be recognized as possessing some degree of relative significance. It is Case XLIV., that of Margaret Robinson, aged about seventeen years, affected from an early period with an irritating disease of the cheek, jaw, and mouth, locally causing the continued flow of saliva and greatly impairing her general health. It will be seen that this young woman was the subject of a large alternating calculus weighing one ounce. It was almost spontaneously expelled in the last moments of exhaustion. In view of the great infrequency of calculus in the female, the fact that one of the four cases occurring to us in the course of thirty years was one in which a persistent and long-continued irritation of the buccal sensory nerves was present, somewhat assimilated it etiologically to the dentition cases of

infancy and childhood, heretofore considered, as arising from reflected dental irritation. To us it appears both pertinent and significant when viewed in the light of the physiological and pathological investigations in which we have been engaged.

SUMMARY.

Having thus carefully presented the anatomical and physiological relations of this portion of our subject, we may summarize a few facts, some of which appear to exclude the hard-water theory of lithogenesis, while they strongly corroborate that of the neuro-dynamic origin of calculus.

First. The largest proportion of subjects being infants at nursery periods of life, the calcareous solutions are not taken by them to furnish the lime for calculous concretions, while the adult, who rarely originates stone, drinks freely of them.

Secondly. As heretofore shown, uric acid forming the nucleus of nearly all calculi, so far from being favored by solutions of lime, would rather be dissolved by them.

Thirdly. The food of the nursing infant being largely albuminous—as in the case of the sucking herbivora, uric acid is found to predominate in the blood and urine. This uric acid, which in the adult exists in less proportion and is probably dissolved in hard-water districts, in the infant forms a nucleus without the chance of solution in the absence of alkaline drinks.

Fourthly. The albuminous food of infancy furnishing abundant material out of which uric acid may be produced, the one overshadowing influence instrumental in its production and in the formation of idiogenic nuclei is the functional disturbance of the liver—*hepatic paresis*—which during this period is produced by reflected dental irritation as heretofore demonstrated. As glycogenesis is artificially produced in the experimental demonstration of Claude Bernard by irritating the floor of the fourth ventricle, so lithogenesis in the nursing infant is morbidly produced by reflected dental irritation of the fifth pair implanted in the same nerve-centre. Imperfect disintegration and imperfect oxidation of albuminous material in the liver is the result of the hepatic paresis thus superinduced. Hence, idiogenic nuclei and, consequently, calculi, are abundant at this period.

Fifthly. After nuclear agglomeration *has taken place*, another excitor of reflex irritation, and new avenues of transmission, are established. The idiogenic nucleus and the xenogenic, from this

time, have a common history; both excite, in a like degree and in the same manner, the elimination from the blood and precipitation of the calcareous elements in the further development and growth of the stone. Calcareous solutions, as drinking-water, probably, now add considerably to the rapidity of accretion.

Sixthly. Although we regard dental irritation, as heretofore described, to be the chief originator of the uric acid nucleus and therefore of the vast majority of autogenic calculi, we cannot exclude the recognition of other influences as giving rise to calculi both in the infant and adult; as all xenogenic nuclei are known to originate calculi and to become covered with calcareous—not often uric acid—strata, by a process of reflex irritation, beginning in the bladder. Irritations of the urethra, of the prostate gland, of the prepuce, all, as we have shown, originate nuclei and promote precipitation; under the influence of spinal injury, we have seen immense productions of calcareous deposits continued in one case—O'Bannon's—for over thirty-nine years.

Seventhly. The influence of living in malarial districts may well and rationally be accepted as acting most potently in the neuro-dynamic origination of calculus. Whether in hard-water districts or in free-stone regions it is known that the nervous system sustains serious impairment of its controlling functions over the secretory organs¹ through malarial blood-intoxication. No organ suffers greater functional derangement than the liver, and on rational grounds we may predicate the abundant production of uric acid and the nuclear agglomeration of idiogenic nuclei. The “critical discharge” of every paroxysm is but the throwing down of earthy phosphates, the *ashes* of the burnt up

¹ It has been observed by M. Burdel, of Viernon, in a paper addressed to the French Academy of Sciences, that malarial fevers seriously disturb the glyco-genic functions of the liver. These are his conclusions: 1st. In paludal fevers there exists a true diabetes or glucosuria. 2d. This glucosuria is only ephemeral, being the indication of derangement of the organism. It appears with the fever, persists during its continuance, and disappears with it. 3d. Glucosuria in paludal fever shows clearly the existence of a special agency destroying the equilibrium existing between the cerebro-spinal and sympathetic systems. 4th. This explanation of Claude Bernard is confirmed by the following facts: The more violent the access, the more intense the chill, the larger also the quantity of sugar in the urine; on the contrary, when the attacks have been frequent and have lost their force, and in a word the more cachexy is established, the less sugar is produced.—*Union Médicale*, 1859, No. 139.

tissues of the body.¹ Thus, under nervous aberration in malarial fever too, we have the production of the uric acid nucleus and also the limy phosphates for super-stratification.

It will thus be seen that, even when we leave the immense catalogue of cases in which the genesis of uric acid nuclei can be clearly traced to reflex dental irritation, we still find greater consistency in the neuro-dynamic etiology than in any other mode of tracing their origin. The subject, in the particular relations in which it has occurred to us, is indeed a vast one, and the field we have entered is one in its present bearings of almost unbroken ground. Some may be discouraged at the labor involved in pursuing a line of thought through the labyrinth of intertangled dependencies necessary to our conclusions; but we are confident that the present method takes us at least in the right direction, and that the study of neuro-dynamic influences, among other obscure questions, will every day become more and more an object of careful attention. We earnestly and confidently hope the important problem of the several calculous diatheses will find full and early solution.

¹ Report on the Nervous System in Febrile Diseases and the Classification of Fevers by the Nervous System. Transactions American Medical Association, vol. XI., p. 549, 1858.

NEW URETHROTOME OR HYSTEROTOME.

By E. B. TURNIPSEED, M.D.,

COLUMBIA, S. C.

THIS urethrotome is an instrument of my invention, for operating in cases of stricture of the urethra, as well as in those of the internal os, and in the neck of the uterus. I have performed the operation of incising the internal os successfully with it very often. It is composed of a cylinder the size of the largest catheter, curved slightly near the cutting end, in which there is a staff; at the farthest or most distant end from the operator are four knives, attached to the staff at equal distances from each other, and concealed within the sloped or conical end of the cylinder. This cylinder has four openings, to correspond with the blades; in advance of the blades, the staff projects with a small knob at its end, to serve as a guide, or if desired this staff can be so made as to clamp a whalebone guide of any size or length.

There have been, I think, some sixty different instruments invented for cutting strictures of the urethra; but, doubtless because of the numerous accidents produced by the use of many of them, the profession was induced some years ago, almost universally, to abandon their use and resort to dilating urethrotomes or divulsors. The latter again have been supplanted, in part, by cutting instruments, but with no marked improvements on their original construction. The difficulties seem to be, first, that the stricture must be passed by an instrument about the size of the canal, before the incision can be made; this involves more or less bruising or tearing of the parts, in proportion to the contraction of the urethra; and secondly, after this is accomplished, the blade or blades are sprung, or pressed out, and the instrument is withdrawn until it passes the strictured point, cutting often too deeply, to the great injury of the submucocellular tissue, and often injuring one or more branches of the

internal pudic artery, causing fearful and even fatal hemorrhage. In addition to these objections, the dilatation is made at the expense of one incision, which amounts, partially at least, to making a new canal at that point, and not to establishing the old one—or the failure, and a recurrence of the disease; or if more than one incision has to be made, it is only by the awkward and unsurgical method of repeating, by withdrawing and reinserting the instrument, and again directing the blade to a different portion of the strictured walls, with about as much certainty or precision as a man would walk a rope who had never attempted it. My instrument is intended to meet these difficulties. It is constructed both to cut and dilate at the same time; a quadrilateral incision being made by gently guiding and pressing the instrument from the operator, and when the conical shaped sheath or cylinder is well engaged in the stricture walls, the staff, by an arrangement at the end towards the operator is pressed down, which then forces the blades out; should the stricture be longer than the length of the blades, they can be withdrawn into the sheath, the instrument again pressed down, and in turn the blades again forced out, thus cutting and dilating at the same time. Doubtless it would be well to have several sizes of this instrument, so that the cutting and dilating could be graduated according to size and repetition of strictures. My opinion is that incisions inflicted on the healthy portion of the canal where the stricture is confined to only a portion of its circumference, would be no disadvantage, since I have seen this done with other instruments with perfect impunity.

As an hysterotome its adaptation is beyond question, being perfectly safe, cutting at four different points and dilating at the same time, never endangering the safety of the patient by hemorrhage, and after an operation, by introducing a sponge-tent medicated, as stated in another paper, with belladonna, the effect is in many cases very promptly beneficial, and gradually improves until a cure is effected. I have operated on a great many cases with this instrument and never with any ill effects, and a large majority have either been benefited or cured, with the aid of the other means employed.

PROOFS OF THE SUPERIOR VALUE OF THE TREATMENT OF
SPONDYLITIS OR POTT'S DISEASE BY SUSPENSION AND THE
RETENTION IN THE IMPROVED POSITION BY THE PLASTER-OF-
PARIS BANDAGE.

By LEWIS A. SAYRE, M.D.,

NEW YORK.

WHEN I made my report to the American Medical Association in 1876, on the advantages of the treatment of caries of the spine by partial suspension of the patient from the head and axillæ to remove pressure from inflamed surfaces, and the retention of the trunk in the improved position thus obtained, by an accurately applied plaster-of-Paris bandage over a skin-fitting shirt, I then ventured the prediction that this plan of treatment would early be recognized as an improvement over all former methods. A very extensive personal experience with this plan of treatment during the past three years, and the corroborative testimony of the experience of the profession both in this country and in Europe which has been brought to my notice, enable me, I am happy to state, in this my second report, to present for your consideration a sufficient amount of confirmative evidence to justify my first prediction.

As the title of this paper suggests nothing but the consideration of the treatment of spondylitis, I shall say nothing in reference to the etiology or pathology of the disease, as I already expressed my views upon these points in my former report, and have nothing new upon this subject, nor have I occasion to change views formerly expressed.

Before proceeding to the consideration of the details of my communication, I wish to express my great obligation and sincere thanks to my assistant, Dr. M. Josiah Roberts, for his valuable aid in the preparation of this paper. To him is due the credit of the arrangement of the histories of the cases; and in addition he has communicated with or personally examined

into the condition of nearly every patient, the history of whom is herein presented, and hence can testify to the correctness of the same.

I present for your consideration the clinical histories, and a summary of the same, of 109 cases of spondylitis of which I have records, and which have come under my personal observation between November, 1874, and January 1, 1879. I have treated many cases, probably as many more during this time, of which I have no record whatever, but confine myself in this report exclusively to those of which I have a recorded history. I have also about forty well-recorded cases now under treatment which have come to my notice since January 1, 1879, but which are not included in this report, as sufficient time has not elapsed to draw definite conclusions as to their result. In addition to these I have seen many cases in consultation with other physicians, and applied the treatment for the first time; but, not having them under my personal observation, have no recorded histories of them.

Of these 109 cases, 4 were located in the cervical region; 2 involved the dorso-cervical junction; 83 were located in the dorsal region; 12 involved the dorso-lumbar junction; 6 were located in the lumbar region; and in 2 cases the location was not mentioned.

In considering these figures the question naturally arises, why is it that we have so great a preponderance of cases occurring in the dorsal region? May it not be owing to the fact that, as the normal posterior curve of the spine is greatest in this region, vertical concussion of the spine, no matter how produced, causes a centering of the forces at the point of most exaggerated curve in accordance with a well-known physical law? The concussion thus produced approximates more closely the anterior portion of the bodies of the vertebræ; and clinical experience has shown that it is in this part of the vertebral column that the disease is most frequently developed.

Of these 109 cases, 66 were males and 43 females, having an average age of nine years and eight months; the youngest being two years of age, and the oldest fifty-four years of age. Of these 109 cases 59 were under eight years of age; 36 between the years of eight and fifteen; 3 between the years of fifteen and twenty-five; 7 were upwards of twenty-five years of age; and of 4 the ages were not recorded. I have treated a number of

cases of this disease under two years of age; but, instead of using the plaster-of-Paris jacket, have substituted the wire cuirass by means of which the spine can be kept in proper position, and the patient be carried in the open air; the only object of the plaster jacket being to retain the spinal column at perfect rest when patients are old enough to walk. The probable reason why the disease is more common among males than females, is on account of the greater exposure of the former to accidents both in childhood and adult life.

Of these 109 cases 60 had a good family history, 12 a bad family history, and of 37 the family history was not obtained. In my earlier records of cases I was not so particular to record the family histories as I have since been.

The number of cases traced to a traumatic origin is 71; the number to which no assignable cause could be given is 38.

Out of the 109 cases, 38 were either partially or completely paralyzed in the lower extremities, and of these 34 have recovered, and 4 remain under treatment. In one case paralysis developed after the application of the jacket, owing perhaps to the fact that the jacket became broken, and did not give the patient proper support. At the present time the patient is gradually recovering the use of his lower extremities. Of these 38 cases of paralysis, 2 occurred, out of the 4 cases, in the cervical region; 1 out of the 2 in the dorso-cervical; 32 out of the 83 in the dorsal; 1 out of the 12 in the dorso-lumbar region; 2 out of the 6 in the lumbar region; and none at all out of the 6 in which the location of disease was not mentioned. From these figures, it will be seen that paralysis may be developed in the course of the disease, no matter in what portion of the spinal column the disease may be located.

Of these 109 cases, 65 are consolidated, or, in other words, cured; 14 are still under treatment; 3 have gone back to the use of iron braces; 1 has abandoned all treatment; 23 have not been heard from; 3 are dead, one of whom died from aneurism of the aorta, the autopsy of which was reported in full to the New York Pathological Society, one from pneumonia, and the third, twenty-four hours after an injury received on a railroad car.

The average duration of treatment in the 65 cases which have recovered is one year and five days. The shortest time in which any case has become permanently consolidated is two and a half

months; the longest time required for the same is three years and seven months.

As corroborative evidence of correctness of the views I have expressed, I take pleasure in calling attention to an admirable summary of them presented by Dr. S. D. Mercer to the Section on Surgery of the Nebraska State Medical Society, at Fremont, June 5, 1878. Speaking of this method of treating spinal curvatures, he says:—

“It is meritorious for three reasons: First, its general utility in all cases; second, its cheapness and elegance; and, third, its accessibility to all practitioners.

“The adaptability of this method removes from the practitioner that haze of difficulty and fog of contradiction which grows darker and thicker in his efforts to select rational treatment from the irreconcilable theories and appliances recommended in this country and in Europe.” . . .

“What could be a greater boon to humanity, and more satisfactory to surgeons, than the discovery of a simple appliance, adapted to all classes of spinal deformities? One cheap enough for the poor, elegant enough for the rich, and convenient enough for the most remote country practitioner. Such an appliance we have in the plaster-of-Paris jacket.”

Mr. C. H. Golding Bird, the distinguished surgeon of Guy's Hospital, speaking in a clinical lecture from a personal experience of upwards of forty cases by this plan of treatment, remarks¹ as follows:—

“Given a crooked spine, the surgeon's endeavors have always been directed either to straighten it, or preventing the increase of the deviation from the normal. Till Sayre introduced his method of suspension and the plaster-jacket, these ends were but inadequately attempted by means of the ordinary ‘spinals;’ and, though doubtless they were a comfort and support to the patient, they could do, and did, from their very mode of action, little or nothing towards cure; for, in caries of the spine, where, first of all, absolute rest should be given to the diseased bones, and in general curvature, where straightening is the main object, these instruments completely fail; for, were they ever so perfect in construction and application, the mere fact of their being taken off every night would be fatal to their usefulness. The essential

¹ The British Medical Journal, Sept. 21, 1878.

difference between Sayre's method and the hitherto adopted 'orthopædic' plan lies in the substitution by the former of a 'pull' for a 'push,' and in the introduction of 'physiological rest' for the diseased spine.

"If you treat a patient upon the 'orthopædic' plan, you fit to him, or rather to his deformity, a leathern jacket strengthened with steel, and so constructed by certain screws, a boss here, or a curve there in the spine, may be pressed against with the idea of driving it in again; which means, of course, the elevation of as much of the trunk as lies above the boss or curve. A pair of steel crutches is added on each side of the apparatus, which can hoist the shoulder to the level of the ears, but which is intended to aid in the support of the body weight above the disease. I never yet saw the case that could bear this for long; the axillæ soon chafe. The inefficiency of this mode of treatment is sufficiently testified to by the number of cripples that one sees, who, from the first appearance of their disease, have been under 'orthopædic' treatment: their apparatus has been altered from time to time to accommodate the increasing deformity. To push up the superincumbent weight of the body from the boss or curve by pressure exerted on either is impossible, and the weight above must be taken off before the spine can 'spring' straight." . . .

"I know of only two circumstances that would prevent my advising the use of the jacket; one where there are no symptoms whatever beyond the deformity, which has remained for long; the patient is already well—a cripple; the other where the patient is in the very last stage of the disease." . . .

"Sore backs and chafes from the jacket are the fault of the putting up; cotton-wool padding should quite obviate such unpleasantness. Very seldom, out of more than seventy jackets, have I seen the skin become really irritable." . . .

"Upwards of forty cases have passed through my hands, and I am deeply impressed with the utility of this treatment by extension. If not cured, you may be sure your patient will not get worse; but, from what I have seen, I believe that even cases which no longer can get comfort from spinal supports may be actually improved by the extension and jacket, the benefit to, or cure of, the patient may now fairly, in point of time, be reckoned by as many months as it formerly took years to do what little good the orthopædic plan was capable of accomplishing.

"When you have reached the limit of improvement in any

case, especially of general curvature, you should give the patient a well-fitting corset, to prevent a relapse; the last plaster-jacket may be cut up, and laced on again; or one of felt or leather, moulded like it, may be employed. It should be laced on while the patient is in the swing, or lying on the ground, and should not be removed more than once in three days. But I warn you against thinking you can improve your patient from the first by using a felt or any other vest that will lace up, in lieu of the plaster-jacket. It is the integrity of the latter that constitutes its perfection; and, once cut up, it becomes little better than the old spinal supports, able to prevent relapse, but not to cure.

“Each fact I have now laid before you I can verify in the cases that have happened to come before me. I urge you to study, while here, this plan of treatment. It will be soon recognized as the only reliable one; and it should be to you—the profession generally, and not to the special practitioners or instrument-makers—that the public should look for assistance. There is nothing special in it; but once allow it to become wrapped in the mysteries of specialism, add improvements, dock it of its simplicity, and you will find lost to yourselves an immense field for doing good, and of giving relief, not only to the rich, but to the poor, who alone can appreciate the terrors of spinal disease.”

Dr. S. Eagon, in his “report of the Progress of Surgery” for the year 1878, read before the Texas State Medical Association, speaking of the acceptance in England of the treatment of distortions of the spine by means of suspension and the plaster-of-Paris jacket, remarks:—

“There, there are no personal feelings, no professional jealousies to obstruct the spread of the plan, and what is the result? Far and wide we find not only surgeons but general practitioners adopting the plan. In every hospital the practice of relieving the spine, when weak or diseased, from the superincumbent weight, by means of an artificial outer skeleton, formed of light materials, cambric bandages, and plaster-of-Paris, is in vogue. The long weary years spent on a couch, often with the face downwards, are now no longer necessary. The cumbrous appliances of mechanics, by means of which it was essayed to force the curved spine straight, are now relegated to the charnel-house of the dead past, where there are leather-covered midwifery forceps, tape ligatures and gorgets. Numerous modifications of Sayre’s

plan are suggested by those who have scarcely mastered his principles. But those who have applied themselves to thoroughly understand them have found little to improve upon. In certain conditions of the atmosphere the plaster dries very slowly, and it has been found that the use of a hot smoothing-iron rapidly evaporates the superfluous moisture. The felt and poro-plaster jacket advocated by some, is a practical giving up of the principle." "In 1877, it is reported, Forneaux Jordon, of Birmingham, an able and well-known surgeon, prophesied that the days of hump-backed men were over; and, speaking in general terms, such seems all but, if not actually, accomplished; a happy result of which American surgery may well be proud."

The classical surgical author, Samuel Ashhurst, M.D., in a review of my work in the *American Journal of the Medical Sciences*, April, 1878, says, in commendation of suspension and the plaster-of-Paris jacket, that:—

"The method is one which cannot be too highly commended, as we cannot conceive of a case suited for treatment at all in which it is not likely to prove advantageous. The fruits of this method will not be confined to the rich alone; but it will prove a boon to the poorer classes of patients, and those who are obliged to depend for their surgical treatment upon public charity. In dispensaries the treatment so clearly laid down by Dr. Sayre should become the established one. Without being oversanguine, we may reasonably indulge the hope that the day is not far distant when our eyes or those of our successors will not so frequently be pained at the sight of deformity produced by the ravages of antero-posterior curvature of the spine; when the wan face and the unhappy expression of its victims shall not so often testify to lives embittered and tempers soured by the suffering of body and anguish of mind consequent upon the unchecked progress of Pott's disease."

Mr. H. Macnaughton Jones, of Cork, Ireland, in a report read before the British Medical Association, August, 1878 (a synopsis of which is published in the *British Medical Journal* of August 24, 1878), speaking from a year's experience in the treatment of fifty cases, remarks:—

"Even as yet it is impossible to state decidedly permanent results in the majority of cases; but, from the details of those read, it will be seen that the superiority and benefit of the jacket over other means of treatment is unquestionable. A large

number of the cases have been treated by other appliances made by the best makers, and under surgical advice. Little or no improvement has taken place, notwithstanding that these supports have been worn for months or years, where the advantages of the jacket were immediate. Some of the patients whose histories have been read, and who are now walking about restored to health under this treatment, had been confined to bed or kept the horizontal position for years."

Sampson Gamgee, F.R.S.E., Surgeon to the Queen's Hospital, Birmingham, in speaking of the advantages of this plan of treatment, says¹:—

"With simple and painless contrivances to spinal affections, the well-established principles of the immovable apparatus, it is possible to promote the repair of lesions which otherwise cause an inconceivable amount of pain, and in a large number of cases lead to fatal disorganization."

Fred R. Fisher, F.R.C.S., Surgeon to the National Orthopædic Hospital, in a letter to *The Lancet*, June 1, 1878, calls attention to the advantages of the plaster-of-Paris jacket in the following language:—

"In the treatment of Pott's disease, the plaster-of-Paris jacket introduced by Dr. Sayre is, as a mechanical appliance, superior to any form of spinal instrument with which I am acquainted. It possesses the following advantages; by completely encircling the trunk, it gives the greatest support and steadiness to the spine that can possibly be obtained by a fixed apparatus. Acting thus as a very efficient retentive splint, it maintains the favorable condition of the diseased spine that is obtained by suspending the patient during its application. It also limits the contraction of the large trunk-muscles which take their origin from the spinal column."

Mr. Berkeley Hill, in a communication to the Clinical Society of London, January 25, 1878,² summarized the benefits which could be accorded to suspension and the plaster jacket, from a personal experience of six months, in the following words:—

"1. Pain was at once arrested. 2. So far as the spine was concerned the patient was immediately able to sit upright, and to walk about. 3. Control of the lower extremities, when lost or diminished, was rapidly improved or restored. 4. Abscesses

¹ *The Lancet*, December 7, 1878.

² *Vide the British Medical Journal*, February 9, 1878.

steadily closed. 5. The spinal column lost much of its abnormal curve, and consolidated in the improved position. 6. In lateral curvatures a permanent increase of stature was often obtained. 7. Finally, by Sayre's jacket the cure was more rapid and less irksome than by any other method."

Dr. George C. Pirrie, of Dundee,¹ remarks:—

"These cases of spinal curvature, with others which I have treated in the same way, show the good results of Dr. Sayre's treatment by suspension and encasing; and I venture to say that, were the same method adopted in all recent cases of spinal disease and curvature, much suffering and ill health would be avoided, and the spinal deformities which we see about frequently on our streets would be almost unknown."

Richard Barwell, F.R.C.S., surgeon to and late lecturer on anatomy at the Charing Cross Hospital, in his recent work on "Curvatures of the Spine," comments on the treatment recommended by me as follows:—

"My experience, though extending only over a few months, has been very extensive, and enables me to say, without overstepping the limits of due and proper caution, that this plan offers the one desideratum so long sought—a means of enabling persons suffering from spinal disease to sit up instead of lying in bed; to take a healthy amount of exercise in the open air, instead of being dragged about in a wheel-couch; and to get well with as little, instead of with as much, deformity as possible."

Various modifications in this plan of treatment have been suggested; but as yet I have seen none that I consider an improvement. Many of them are decidedly objectionable—as, for instance, the addition of glue to the plaster, or the use of silicate of soda in its stead, as each of them is impervious and therefore injurious; whereas, the plaster-of-Paris applied on the cross-barred muslin is porous and allows the evaporation of the insensible perspiration. In this respect it possesses all the advantages of the "porous-felt splint" and the infinitely superior advantage of being applied with the greatest accuracy to all the inequalities of the body, and being retained exactly in this position when "set," thereby necessarily giving better support than can possibly be obtained by any splint applied over any other mould than

¹ *Vide* reprint of paper from the Edinburgh Medical Journal for September, 1878, prepared for the annual meeting of the Forfarshire Medical Association, held at Forfar, July 11, 1878, but for want of time unread.

that of the body itself. The plaster jacket also, by completely encircling the body, gives a much more secure support than can possibly be given by any incasement divided through the centre. The porous felt splint, in order to be made sufficiently pliable for moulding to the body, requires to be heated to such a degree that it becomes necessary to protect the body with a layer of cotton before it is applied. This method of procedure necessarily fills up all the little irregularities and prevents the jacket from giving a firm support.

Dr. Stillman, of Plainfield, New Jersey, has made a modification in the application of the plaster-of-Paris bandage by applying it in two segments—one encircling the body below, and the other above the diseased vertebræ. Into each of these segments eyelets or sockets are incorporated for the reception of extension-bars by means of which the two segments can be separated as occasion requires, when the jacket may cease to give the proper support on account of the absorption of the tissues pressed upon. It is possible that there may occur cases in which this modification might be used with advantage, though its range of usefulness must necessarily be limited. Dr. John A. Wyeth reported to the New York County Medical Society one case successfully treated by means of this appliance. My own impression is that it is better, and it has been my practice, to discard the old jacket and apply a new one, when it has ceased to give efficient support. This, I think, is the preferable plan, both on account of cleanliness, and the simplicity and lightness of the apparatus; and, in addition, it renders you independent of the instrument-maker, a matter of vital importance to the country practitioner.

In confirmation of this statement, I would refer to the history of a case reported by Mr. Berkeley Hill to the Clinical Society of London, January 25th, 1878.¹

“The first case treated in University College Hospital, after Dr. Sayre had himself demonstrated his method, was put up on July 13th. The patient immediately lost the pain in her back, which up to that time had been too severe to permit of her walking about or sitting up for more than half an hour at a time; and she went for a walk out of doors of her own accord the same day. Two days later, she went into the country till November. She at once discarded invalid habits; and in the latter part of her stay nursed a sick sister. The jacket put on in July

¹ *Vide* British Medical Journal, February 9th, 1878.

was worn till nearly Christmas; it was then removed, and a poro-plastic felt corset moulded on to the trunk while the patient was suspended. This did not appear to give sufficient support, as the pain in the back had returned frequently and increasingly. Hence Mr. Hill exhibited the patient wearing her corset—an excellent fit—to show that this material did not embrace the trunk with sufficient immobility to support it effectually.”

The modification suggested by Dr. Thomas James Walker, of Peterborough,¹ which consists in applying the plaster bandages while the patient is in the recumbent position, having previously placed underneath a many-tailed or Scultetus bandage saturated with plaster-of-Paris and gum, is, I think, the best modification that has been suggested; its practical objection being the gum which is used, rendering the jacket when applied impervious.

The addition of salt or alum to the plaster to make it set more quickly, as suggested by some, renders the plaster friable, and it is constantly crumbling off; hence it is not so durable. With good plaster there is no difficulty about the “setting,” without the addition of salt or alum. In some cases it may be advantageous to facilitate the evaporation of the moisture by blowing upon it with a pair of bellows, or rolling it with a hot iron.

As an explanation of why this plan of treatment has failed to give satisfactory results in the hands of some, I think it will be in order to cite a case reported in the *London Lancet* of February 8th, 1879, by Julius Cæsar, L.R.C.P. Ed., etc. He gives the history of a case where life was endangered by imprudently suspending the patient: that is, he continued extension upon the spine after the child had by its cries given conclusive evidence that severe pain was being produced. This he did in direct violation of the rules which I have laid down for the performance of the operation of suspension, which he acknowledges having done by stating “that he conducted the operation in accordance with what he was taught when a resident at the East London Hospital for Children, combined with the result of a superficial reading of Sayre’s book.”

Many failures have come under my own notice which were due solely to a want of knowledge of the rules and principles that should guide one in the use of this plan of treatment.

Dr. Fred. R. Fisher, in speaking of “rumored” instances where injury had been done to patients in attempting to follow the

¹ *Vide* The Lancet, December 28th, 1878.

method of suspension which I have recommended, aptly remarks:¹—

“If mischief has been done by suspension, I am convinced that this arose from want of proper care in conducting the process. I have suspended patients of all ages and with all conditions of disease, without the least signs of a mishap. Every new method of surgical treatment has to stand the test not only of those who carry out the design of its originator faithfully, but those who disregard or neglect to acquaint themselves with the proper course of procedure. When going through the wards of a hospital not long after Dr. Sayre’s visit to this country, I saw in one of them a little child suspended by the head, hanging in mid-air, kicking, struggling, crying to the very best of its ability, and manifestly not altogether enjoying himself. This, I was informed, was Sayre’s method of treating Pott’s disease, and that the child was then taking his daily exercise, three times up and down again. I suggested that daily suspension was advised for lateral curvature, and not for Pott’s disease, and was fortunately able to convince my friend of this truth by reference to Sayre’s work. Now, had this gentleman continued to misapply suspension, he would, no doubt, before long have been convinced of the serious dangers attendant upon its use. There are very few surgical processes which may not be productive either of a good, a negative, or a bad result, the effect produced depending partially upon the nature of the case, greatly upon the method of conducting the operation. So with suspension in some cases of Pott’s disease it is useless; in the great majority it is of much value; in all it may be made the means of doing serious harm.” “In no case is it necessary to draw the patient quite off the ground. Generally it is sufficient to draw him up until the heels are just raised. In very young children, and in cases where the spine is affected towards its lower extremity, it is as well to extend until the heels are raised about one inch. Suspension should be conducted very slowly, and, when possible, by the head alone; but for adults, and children with extensive disease in the upper region of the spine, the axillary bands should also be used.”²

¹ The Lancet, January 25, 1879.

² The plan recommended by me in cases of spondylitis is to extend the patient from head and axillæ until made *comfortable*, and *never beyond that point*, whether the heels be raised from the floor or not, or whether any change has

“Conducted carefully, and with the observance of the above precautions, suspension cannot possibly do harm; and I could, if space permitted, bring forward abundant evidence to prove its value in the treatment of Pott’s disease. Undoubtedly this part of Sayre’s treatment is not to be discarded because those who have misapplied the process have thereby obtained unfortunate results, or because others, believing it to be useless, or perhaps fascinated by some other method of their own contrivance, have hastily condemned it without a fair trial of its capabilities.”¹

been made in the curve at the point of disease. The change in the kyphotic curve is usually very slight or none at all, the improved position being almost exclusively due to a change in the compensating curves. When you have reached the point of comfort, the patient should then be retained in this position, by a properly applied gypsum bandage.

Having observed, through the medium of medical journals, that some of the most distinguished German surgeons have used and recommended chloroform to be administered during suspension of the patient for the further reduction of the deformity previous to the application of the jacket, I would here state, that I cannot too strongly condemn this practice. The only indication for the proper amount of extension can be obtained from the verbal statement of the patients, the object being to extend until they are made comfortable. If the patient be anesthetized, of course this essential guide to the proper amount of extension is lost.

¹ Since the reading of the paper I noticed in the *Berliner Klinische Wochenschrift* for May 12, 1879, the following communication by Dr. Theodore Walzberg, Assistant of the Göttenberg Surgical Clinic:—

“In regard to the discomfort to the patient caused by the long time the bandage remains on, and the question of movable jackets for the treatment of the kyphosis, Dr. Walzberg says:—‘When we are not positively certain about the condition of the inflamed vertebræ, we should not risk the patient’s health, on account of a question of toilette. I would speak a word for the knitted vest, whose meshes form a ventilating apparatus between the skin and the bandage, whose capacity should not be underestimated. The condition of the skin after the removal of the bandage testifies that its activity is not materially injured. The moisture is absorbed and evaporated by the gauze; I have never seen indications of maceration. There is only to be found a mass of small scales of epidermis, such as may be observed on invalids who have lain long in bed, and have missed the friction of clothing. That the flannel, over which the plaster jacket is sometimes applied, accomplishes this aim much more imperfectly on account of its inferior porosity and capacity for ventilation, seems to me to be an undoubted fact. However that may be, we cannot recommend the application of movable jackets in kyphosis.

“‘It may be highly recommended within certain limits in scoliosis; and it is not to be denied that the poroplastic felt jacket, described by Madelung, will be very welcome. Madelung himself has drawn the limits of its applicability. Its use is only possible in clinics, as it is expensive; the treatment is also only applicable in cases of slight scoliosis, or those which are already far advanced towards a cure, on account of the want of firmness of the felt. Movable plas-

My friend, Dr. S. W. Gross, informed me some months since that he applies the "jury-mast," or head support, in *all* cases—and having tried it in a number of cases since, I am convinced he is correct. I formerly limited it to cases in the cervical region, but now use it in all cases above the middle dorsal region. See Case IX.

Dr. Benjamin Lee,¹ speaking of suspension as a means of treating spinal diseases, states that, "In 1870 I was using an apparatus for self-suspension as a means of treating this class of diseases. At that time, I say it without the slightest fear of contradiction, no physician either in America or Great Britain was making use of suspension, and none anywhere was making use of self-suspension as a therapeutic means."

I believe that Dr. Lee is perfectly justified in claiming to be the only one who was in 1870 using this plan of treatment for spinal curvature, although it had been in use more than a hundred years ago in Germany; and in the discussion of his paper, Dr. Henry H. Smith, of Philadelphia, said, "He feared there was such a thing as living too long when he noticed the plans of treatment formerly well known had been lost sight of, and others re-named as novelties. Fifty years ago, in the practice of J. K. Mitchell, of this city, the speaker had seen almost the same apparatus for suspension by the head and shoulders as had been exhibited this evening. This plan was then used by Dr. Mitchell with the promise of very excellent results, but in several instances in which it had been tried under the speaker's observation the result was not what had been anticipated by either the surgeon or the patient. Indeed, very little had been gained by suspension that was not also derived from the old treatment of confining the patient to bed."

Why did a plan of treatment "that gave promise of such excellent results" fall so entirely into disuse that in 1870 Dr. Benjamin Lee, of Philadelphia, was the only one using it in either Europe or America? This is a very pertinent question,

ter-bandages are *eo ipso* useless, as long as a correction of the scoliosis is to be attained by suspension of the patient, since their use would be followed by a sinking back of the form to a condition previously overcome. Felt jackets are without this disadvantage on account of their adaptability to the figure. For the practical surgeon, however, the plaster-of-Paris bandage is so far the only and fully sufficient remedy (or expedient). We have never had serious complaints about the jacket, in regard to the length of time it remained, even from patients in the higher class.' "

¹ Philadelphia Medical Times, March 15, 1879.

and may not the answer be found in the fact that no fixed appliance was made to the body to retain the improved position gained by suspension?

Dr. Lee says: "Subsequently, at the meeting of the American Medical Association in this city, in 1876, I placed the same frame at the disposal of Dr. Lewis A. Sayre, of New York, in order that he might demonstrate his brilliant discovery of the application of the plaster-of-Paris bandage to the treatment of caries of the spine."

This "brilliant discovery" to which the Doctor refers is simply due to the fact that the plaster-of-Paris bandage, when wet, can be applied with the greatest accuracy to every inequality of the body, thus making a perfect mould, and when "set" or dry retaining its position without shrinking or stretching, cracking or bending, thus retaining the body in the improved position which suspension has given to it, without the slightest inconvenience from abrasion, or pain from undue pressure at any one part, the support being equally diffused around the entire body by the plaster bandages being accurately moulded over a skin-fitting shirt. This plan of treatment has yielded better results than any other yet discovered, and is now adopted in all parts of this country and in Europe by our profession.

It is of the most vital importance that it should not be destroyed by attempts at improvement, and thus fall into the same disrepute that extension alone formerly did. I have therefore thought it necessarily incumbent upon me to explain the superiority and the simplicity of this plan of treatment over all previous methods and the modifications of it that have been proposed, and in proof of this statement, annex the following synopsis of cases treated on this plan.

EXPLANATORY NOTES.

The titles in the following histories, "Hospital for Ruptured and Crippled," "42d St. Hospital," "Knight's Hospital," are used synonymously.

"*Duration of Treatment by the Gypsum Bandage*," does not signify the exact time required for consolidation to take place, for that cannot be determined. Consolidation has always taken place before the final removal of the jacket; it may have been weeks or months previous.

A careful study of the individual cases herein presented will show some important errors, and many minor ones, in this plan of treatment, all of which have been faithfully recorded, for the purpose of rendering their occurrence in the future less liable.

It must be borne in mind that the "*Family History, Condition and Treatment previous to the use of Suspension and the Gypsum Bandage*," is recorded as given by patient or friends, and must necessarily contain minor errors of statement.

The date given under "*Condition when use of Suspension and Gypsum Bandage was begun*," is also the exact date of the application of the first jacket, which is recorded under the head of treatment.

Case 1. Eliza Ann M., St. Catherine, Canada, aged nine years. (Sent by Dr. Mack.)

Case 1.



Spinal Curvature before and during Suspension.

Family History, Condition, and Treatment previous to the use of Suspension and the Gypsum Bandage.—Father died of phthisis, December 25, 1877. Had a fall; and, shortly after, developed a "lump" about the size of a marble over the last dorsal vertebra. An improvised brace was applied, but the disease increased.

Condition when use of Suspension and Gypsum Bandage was begun.—April 30, 1875. Spondylitis affecting the eleventh and twelfth dorsal vertebræ, and the first, second, and third lumbar vertebræ, all of which are markedly prominent. Deformity greatly improved by suspension.

Treatment by the use of Suspension and the Gypsum Bandage. Patient's Condition from time to time.—Patient suspended, and a plaster-of-Paris jacket applied, which gave great relief. August, 1875, uncle states in his letter that he and the family physician have been able to remove and to apply the plaster dressing when necessary, giving the child perfect comfort.

Remarks.—*Vide* published history in Sayre's "*Spinal Disease and Spinal Curvature*," p. 28.

Case 2. Michael N., aged three years.

Family History, Condition, Treatment, etc.—Parents healthy. Patient healthy and active until Dec. 1874, when "stiffness" of

right side was noticed. Treated at a public institution for hip disease without relief. In March, 1875, swelling on right side of spine was noticed. This gradually increased to the size of a hen's egg.

Condition when use of Suspension and Gypsum Bandage was begun.—Spondylitis of the dorso-lumbar junction.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—April 31, 1876. Patient examined at college clinic; tumor freely incised, giving exit to a considerable amount of unhealthy pus and a tough slough of connective tissue. Probe detected carious bone on right side of lumbar vertebræ. Cavity filled with Peruvian balsam and covered with oakum and oiled silk. Patient suspended by head and axillary straps, and gypsum bandage applied as usual, a fenestra being cut over seat of abscess. Child comfortable and able to stand without other support.

Case 2.



Spinal Curvature before and during Suspension.

Fig. 1.



Wore jacket six weeks, when, on account of pain, it was removed, and another abscess, below and to the right of the first, was found. This was treated in the same way as the first abscess. Shirt applied and patient suspended. A pin, passed through a folded card, was placed over the wound, so that each turn of the bandage passing over the pin indicated the place over which it was desired to cut a fenestra (Fig. 1). After the

application of the jacket the child could run about without other support. Oct. 20, 1875. Child much improved in health and increased in flesh. Abscesses had ceased to discharge. Child able to stand erect without jacket. Spine almost consolidated. New jacket applied without fenestra, which was worn until January, 1876, when it was found that consolidation was complete.

Duration of Treatment by Gypsum Bandage.—About ten months.

Result.—Consolidated with scarcely any deformity. Three jackets used.

Remarks.—*Vide* published history Sayre's "Orthopædic Surgery and Diseases of the Joints," p. 381. Also Sayre on "Spinal Diseases and Spinal Curvature," p. 78. Subsequently died.

Case 3. John J., Third Avenue, New York, aged five years.

Family History, Condition, Treatment, etc.—Parents healthy. In January, 1873, Pott's disease appeared in the lumbar region,

Fig. 2.

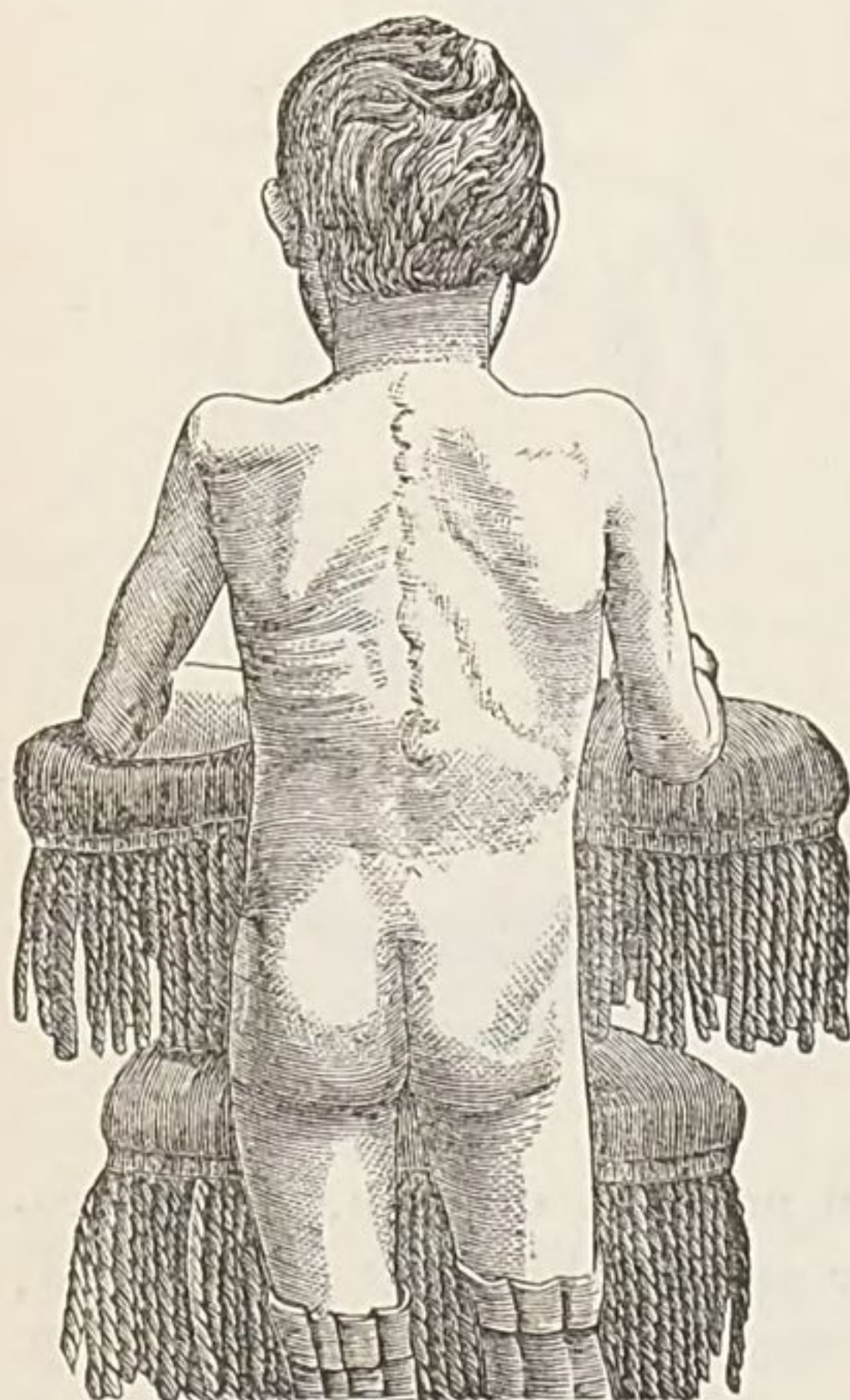
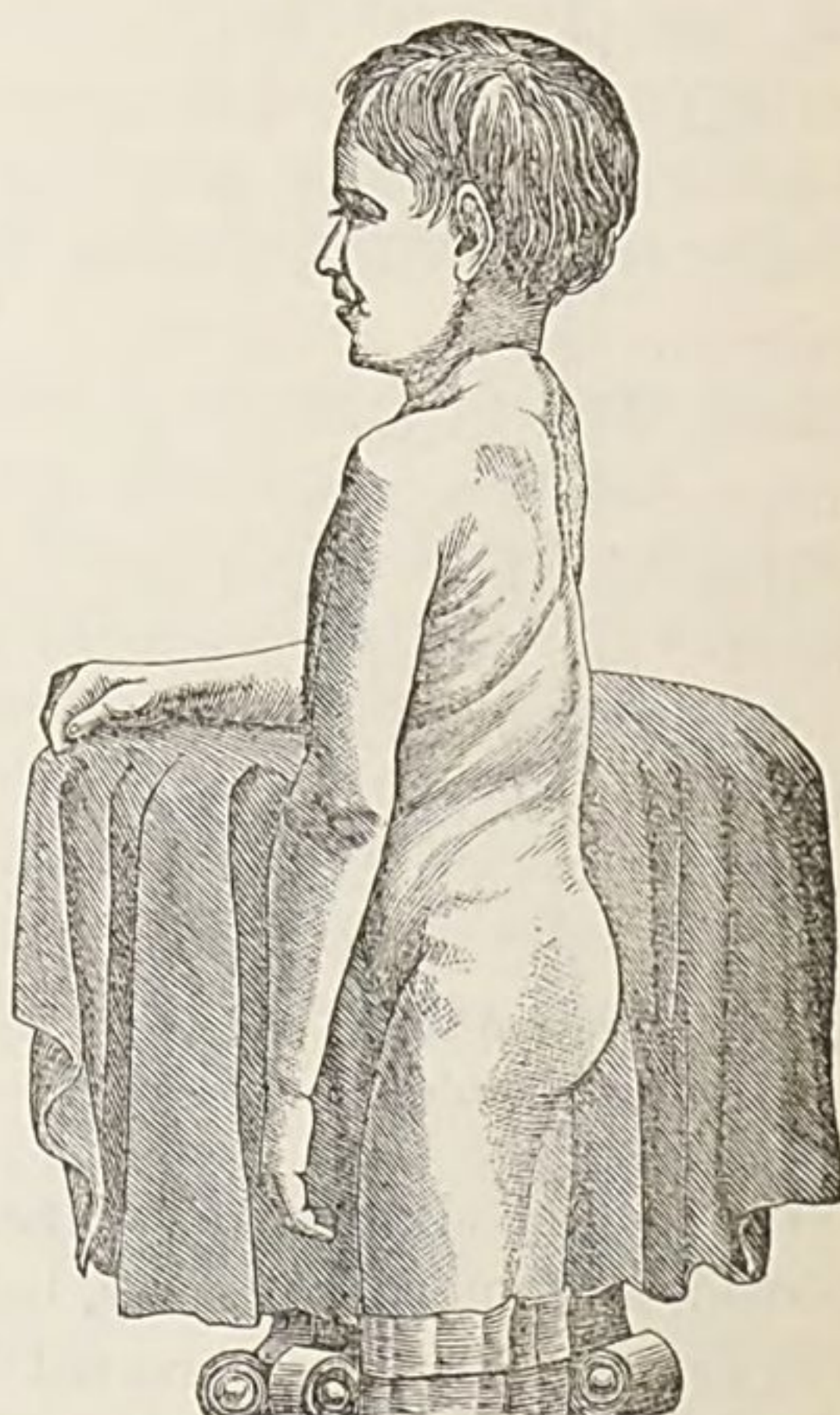


Fig. 3.



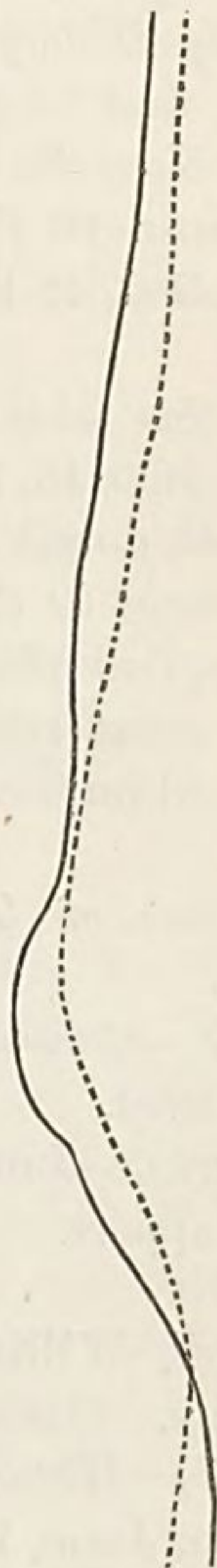
for which no cause could be assigned. A wheel crutch was used until April in the same year. In May, 1874, a raw-hide jacket was fitted to the child, which gave great relief. He was again

seen in 1874, when he looked well. He continued to run about until June 4, 1875, during which time he had outgrown his jacket.

Condition when use of Suspension and Gypsum Bandage was begun.—Spondylitis affecting lower dorsal vertebræ.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—June 4, 1875. Patient was held out as straight as possible by two assistants pulling, the one from the shoulders, and the other from the ankles, a flannel shirt having been adjusted to his body; then a bandage, saturated with plaster of Paris, was carried around the pelvis and up to the axillæ.¹ Child was sent home feeling quite comfortable. I was sent for that evening in great haste, and found him suffering from too great compression of the thorax. I made an incision of about three inches from the top through the plaster, which gave immediate relief. Dressing worn until July 26, when it was found that a fold in the shirt had produced uneasiness. Upon removal a slight abrasion over the crest of the left ilium was found. July 31, abrasion healed. Child suspended in a sling from head and axillæ, the body being the extending power,² and a plaster jacket applied. Sept. 22. Presented at my clinical lecture; jacket removed, when patient could bear concussion without pain, and appeared to be perfectly well and with but slight deformity. (See Figs. 2, 3.) Another plaster jacket was applied however, to guard against any possible accident. Nov. 1, jacket sawed open and removed, firm consolidation having taken place. He is allowed to wear his jacket to satisfy himself, although not necessary. Jan. 1, 1876. Perfectly well, and needs no support.

Case 3.



Spinal Curvature before and during Suspension.

¹ I have abandoned this plan, as it is not so good or safe as suspension.

² This is the plan I now adopt in all cases.

Duration of Treatment by Gypsum Bandage.—About six months.

Result.—Consolidated with slight deformity. Four jackets used.

Remarks.—*Vide* published history Sayre on “Spinal Diseases and Curvature,” p. 24.

Case 4. William W., No. 45 Orchard Street, New York, aged two years.

Family History, Condition, Treatment, etc.—No known cause. Disease first noticed about November, 1872. I first saw patient Nov. 20, 1873, when I applied a Taylor’s brace, which was worn until Feb. 12, 1874, when a Darrach’s raw-hide jacket was applied, it having been fitted to a plaster mould of the back.

Condition when use of Suspension and Gypsum Bandage was begun.—June 15, 1875. Spondylitis affecting the seventh, eighth, and ninth dorsal vertebræ. Marked deformity.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—Applied plaster jacket during suspension, which afforded patient great relief. Sept. 1875, another jacket was applied. Continued improvement. Afterwards two or three more jackets applied.

Duration of Treatment by Gypsum Bandage.—About ten months.

Result.—Consolidated, with slight deformity. Four or five jackets used.

Remarks.—June, 1877. Patient remained well, and wore no spinal support.

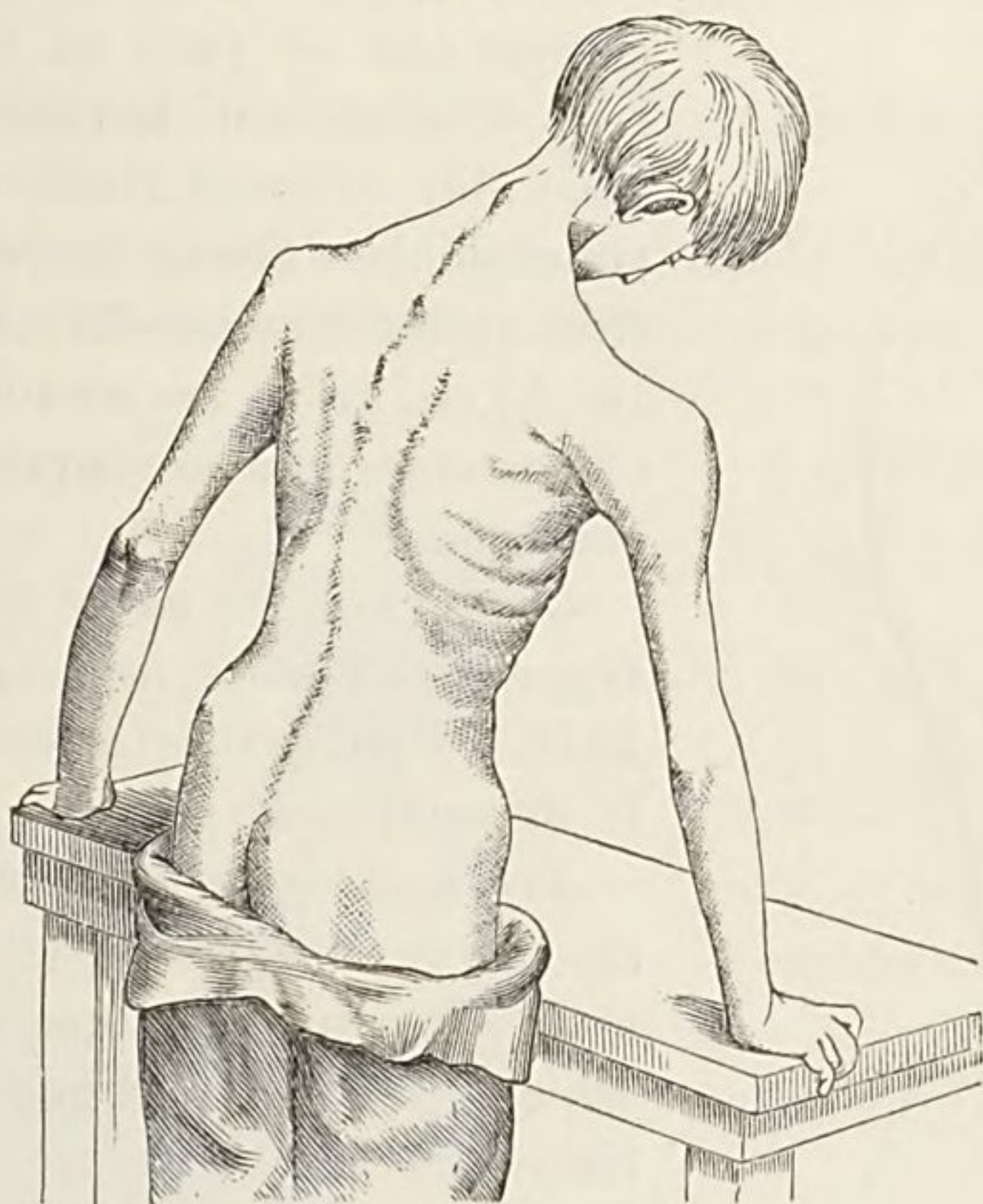
Case 5. William Wheeler, Keyport, New Jersey, aged forty-two years. (Brought by Dr. Arrowsmith, of Keyport, N. J.)

Family History, Condition, Treatment, etc.—Thrown from a wagon, June, 1874, striking upon left side and back. Two hours after regained perfect control of himself. A week later, treated for inflammation of the bowels without relief. Patient went to St. Luke’s Hospital, where he remained and had a Taylor’s brace applied. This, he says, gave him no relief.

Condition when use of Suspension and Gypsum Bandage was begun.—July 26, 1875. Spondylitis. Very much emaciated, and position as shown in Fig. 4. Sense of constriction around ab-

domen causes intense pain. Cannot walk without great discomfort. Unable to lie in any position except on the face and abdomen, and even then requires to be "pulled out" to get relief from pain. Extension of spine gives perfect relief.

Fig. 4.



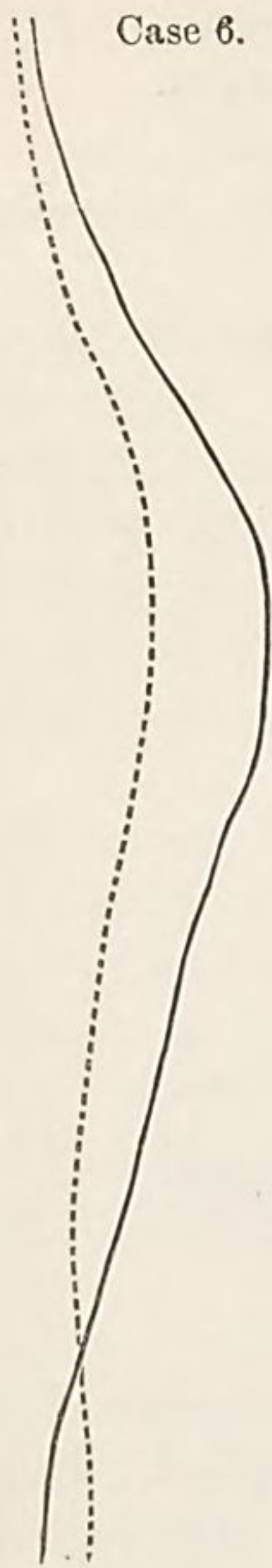
Treatment by the use of Suspension and the Gypsum Bandage, etc.—Patient suspended and a plaster jacket applied. He stated that this gave him greater relief than he had experienced for a year. The following Friday a new jacket was applied, and at the suggestion of the patient padding was placed on either side of the projecting spine and over the abdomen, the latter being removed after the plaster had "set" to make room for distension after eating. A week later he reported favorable progress.

Result.—Died, April 28, 1876, of aneurism of the thoracic aorta.

Remarks.—Post-mortem showed extensive destruction of the vertebræ. *Vide* published history Sayre's "Orthopædic Surgery, and Diseases of the Joints," p. 278. Mr. Wheeler was one of my pioneer cases in the treatment of spondylitis by suspension and the plaster jacket, and I gladly acknowledge my indebtedness to him for several valuable suggestions. He it was who first suggested the use of the "dinner-pad."

Case 6. Minnie O'B., No. 344 East Thirty-second Street, New York, aged three years.

Case 6.



Spinal Curvature before and during Suspension.

Family History, Condition, Treatment, etc.—Healthy parents. Patient well previous to Nov. 1873, when she fell down stairs. Shortly afterward she complained of pain in the epigastric region, since which time she has not been able to stand erect. During this time she has always experienced relief from suffering when lifted by her arms. In April, 1875, an undue prominence of vertebræ in dorso-lumbar region was observed.

Condition when use of Suspension and Gypsum Bandage was begun.—Aug. 4, 1875. Spondylitis affecting vertebræ in dorso-lumbar region.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—Suspended and gypsum bandage applied, after which patient was comfortable and entirely free from pain. Sept. 5. New jacket applied, as old jacket had begun to feel uncomfortable. Oct. 24. Old jacket too tight. New one applied Oct. 29. Child comfortable.

Remarks.—Lost track of case. Left in charge of Dr. Robert Taylor.

Case 7. Charles C., No. 341 East Thirty-second Street, New York, aged twelve years.

Family History, Condition, Treatment, etc.—Parents healthy. Child strong. During time of teething, which began when child was eleven months old, he had convulsions. No known cause of spinal trouble.

Condition when use of Suspension and Gypsum Bandage was begun.—Aug. 5, 1875. Spondylitis of lumbar region.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—Plaster jacket applied during suspension, which gave perfect relief from pain. Nov. 8. Child been well and playing with

other children. New jacket applied. Two other jackets subsequently applied. From the first application of the jacket, patient never had a bad symptom.

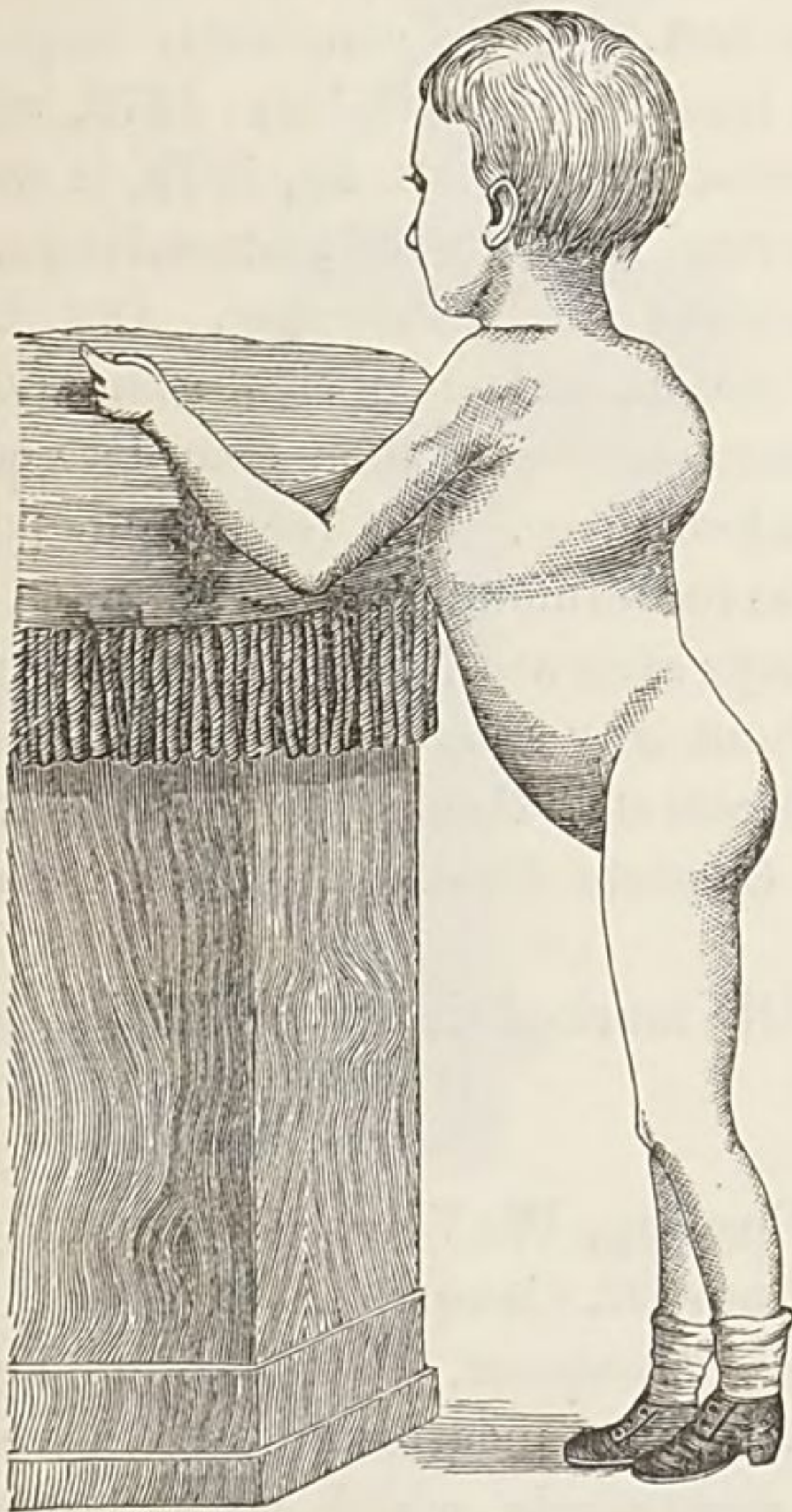
Duration of Treatment by Gypsum Bandage.—About ten months.

Result.—Consolidation with exceedingly slight deformity.

Case 8. Thomas H., No. 334 East Fortieth Street, New York, aged six-and-a-half years.

Family History, Condition, Treatment, etc.—Family history bad. Father dead. Has had difficulty of breathing since seven months

Fig. 5.



Case 8.



Spinal Curvature before and during Suspension.

of age, also cough and occasional vomiting. Cause of trouble unknown. When two years of age, undue prominence of spine was noticed. Patient taken to Dr. Knight, who applied a brace, which was worn until Aug. 31, 1875 (four years). Patient has been unable to walk since June 1, 1875. Has had almost constant priapism from phimosis.

Condition when use of Suspension and Gypsum Bandage was begun.—Aug. 31, 1875. Spondylitis of upper dorsal vertebræ. Unable to walk. Can stand if supported. Fig. 5 is from sketch by Dr. Taylor.

Treatment by the use of Suspension and the Gypsum Bandage, etc.—Operated for phimosis, suspended patient, and applied plaster dressing from hip to axillæ. Perfect relief. Sept. 1, 1875, can stand alone. Sept. 11, dressing removed. Slight excoriation on sternum. New jacket applied. March 23, 1876, patient returned much improved; new jacket applied. July 11, 1876, two new jackets applied since last date; also a new one to-day. Can walk, run, and play now. May 4, 1877, new jacket applied. Patient has no pain. Nov. 6, patient has worn with comfort the jacket applied in May last. He is constantly improving. New jacket applied. This was worn until July, 1878, when it was removed and a new one applied. Oct. 22, 1878, is wearing jacket applied in July. General health good; attending school. Sleeps well and eats well, except in the morning. Oct. 25, old jacket removed and a new one applied. Cervical glands enlarging on right side. Old jacket removed, when complete consolidation was found to have taken place. The recumbent position with foot of bed elevated, was recommended, together with tonics and a liberal diet. A few days afterward patient got up, and has since been going about without any spinal support, and says he feels right well. Cervical abscess still discharging.¹ April 2, 1879.

Duration of Treatment by Gypsum Bandage.—Three years and seven months.

Result.—Consolidated with marked deformity. Ten jackets used.

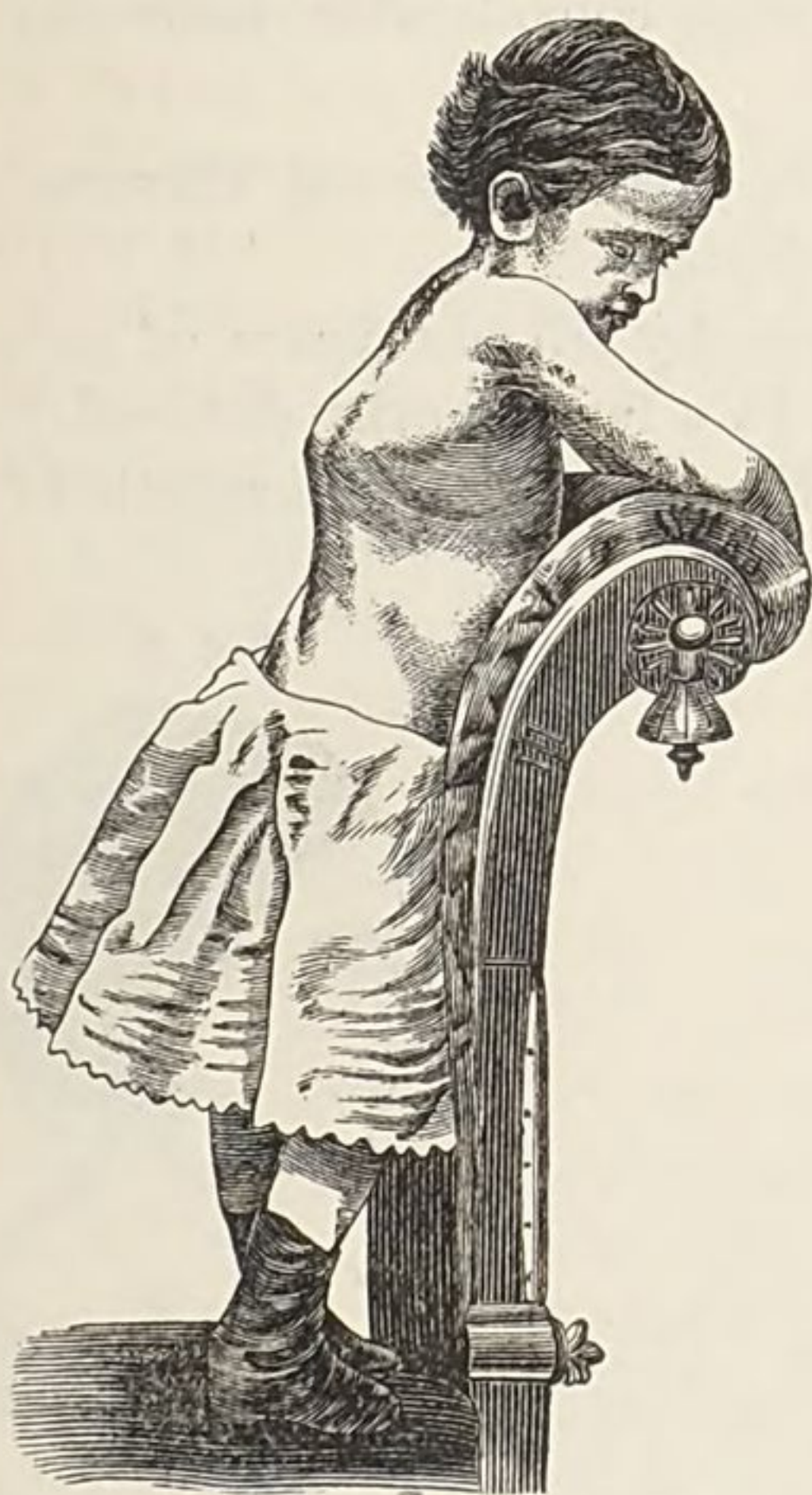
Case 9. Carrie E. G., Wheeling, W. Va., aged five-and-a-half years. (Came with letter from Dr. Campbell, W. Va.)

Family History, Condition, Treatment, etc.—Parents healthy. Child robust. In Jan. 1872 she had measles followed by chorea. Some weeks afterward had pneumonia, which lasted till spring, when she began to creep about, using chairs to aid her. Complained of constant pain in left side and epigastrium. No record of injury. In June, 1874, undue projection of spine noticed. Taken to the Indianapolis Institute, where two braces were applied.

¹ Died Aug. 31, 1879, from pneumonia.

using chairs to aid her. Complained of constant pain in left side and epigastrium. No record of injury. In June, 1874 undue projection of spine noticed. Taken to the Indianapolis Institute, where two braces were applied.

Fig. 6.



Case 9.



Spinal Curvature before and
during Suspension.

Sept. 1, 1875, patient first seen, having spondylitis affecting the seventh, eighth, and ninth dorsal vertebræ. Unable to stand, even with the aid of crutches. Position as shown in Fig. 6. Extension greatly relieves deformity.

Plaster jacket was applied during suspension of patient. The following day child was able to walk without other support than the jacket, and the second day after the application of the jacket she went to ride in Central Park. After the first application of the jacket, patient's father applied it as occasion required. March 29, 1879, patient returned to me for treatment. Upon examination I think the jurymast would afford her more comfort than the jacket alone, as extension from the head relieves her. April 3, 1879, new jacket applied, with jurymast.¹

Under treatment about two years and ten months, when she became consolidated, though with considerable deformity.

Case 10. Maria Louisa D., aged ten years, Havana, Cuba. (Brought by Dr. Zayas, of Havana.)

Parents healthy. Child healthy till six years of age, when she fell and hurt her back. In a few months deformity developed. Iron brace applied. Has had partial paralysis of lower

Fig. 7.



Fig. 8.

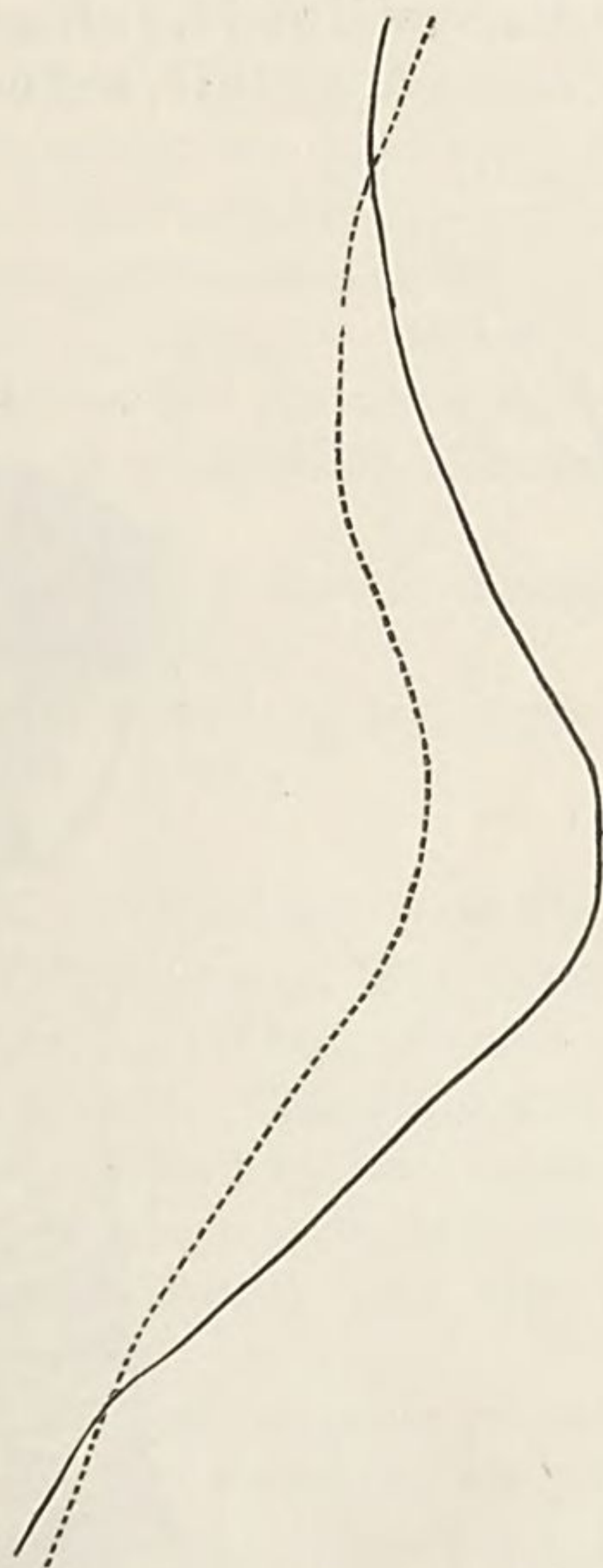


¹ July 3, 1879, jacket applied on April 3, was made into a corset. Upon examination to-day, found consolidated. Corset is to be worn a few months longer to guard against accident.

extremities at times. When five years old had an attack of eclampsia, which lasted about five hours. Has worn brace constantly.

September 10, 1875, patient first seen, having spondylitis of sixth, seventh, and eighth dorsal vertebræ. Spinal curve has remained about the same for three years, and position is as seen in Fig. 7. Suspension relieves deformity considerably.

Case 10.



Spinal Curvature before and during Suspension.

Plaster jacket applied during suspension of patient. Her position was much improved, she was comfortable, and could walk without other support. Nov. 16. Patient has gained in flesh. New jacket applied. Nov. 20, left for Havana. Jan. 15, 1876, I saw her in Cuba, she being in perfect health and much

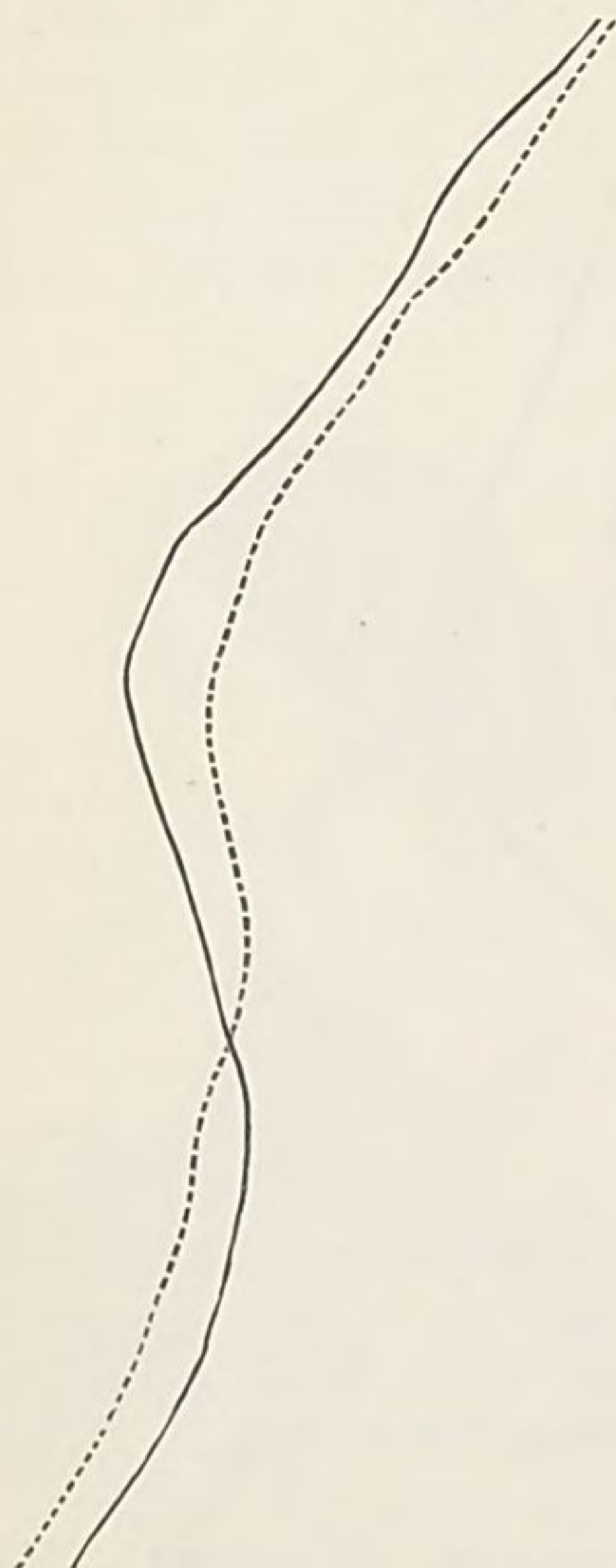
stouter. The same jacket was upon her which I applied Nov. 16, 1875, but it required removal on account of her increased growth. Before removing jacket Dr. Zayas had a photograph taken (see Fig. 8). New jacket applied.

Under treatment ten months. Consolidated with only slight deformity. Three jackets used.

Remarks.—*Vide* published history, Sayre's "Spinal Disease and Spinal Curvature," p. 28.

Case 11. Matilda B., New Utrecht, L. I., aged thirteen years. Parents healthy. About April, 1873, had measles, followed by

Case 11.



Spinal Curvature before and during Suspension.

Fig. 9.



inflammation of the right knee-joint, from which she recovered and afterwards developed spondylitis of the dorsal vertebræ

without known cause. I first saw patient April 15, 1875, and advised a Taylor's brace, which was applied April 23 and worn until Sept. 16, when it was removed, having produced excoriations on each side of the vertebral prominence.

Sept. 16, 1875, patient first seen, having spondylitis affecting the seventh, eighth, and ninth dorsal vertebræ.

Plaster jacket applied during suspension, which made the patient perfectly comfortable, although there is a slight lateral curve of the spine due to carelessness in the application of jacket. Dec. 10, 1875, has worn jacket first applied up to date without the slightest discomfort. To-day she says it feels a little tight. New jacket applied, which improved her position and made her comfortable. May 1, 1876, wearing second jacket and refuses to have it removed, though she seems cured. June, 1876, old jacket cut down and made into a corset. Its use was continued during the summer, and in the fall she was discharged cured. Fig. 9 gives a correct idea of her position after the application of the second jacket.

Under treatment about one year. Consolidated with slight deformity. Two jackets used.

Remarks.—*Vide* published history, Sayre on "Spinal Disease and Spinal Curvature," p. 23.

Case 12. Dexter B., Cocksackie, New York, aged four years.

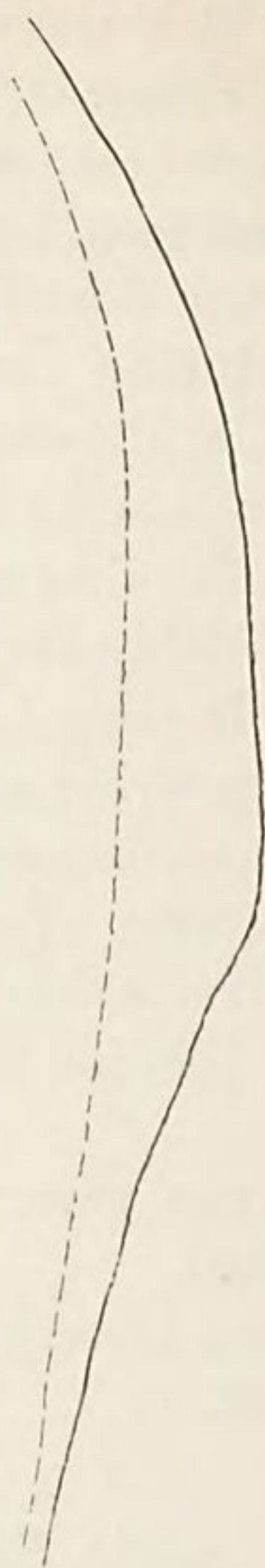
Robust child, until February, 1874, when he had scarlatina. He regained his health. When two and a half years old, he weighed forty-two pounds. Cause of spondylitis unknown.

When I first saw patient he had spondylitis affecting the lumbar vertebræ. Child stooped, and was constantly leaning on something. Was unwieldy, and very heavy. Suspension greatly reduced deformity.

Advised Darrach's wheel-crutch in connection with the plaster jacket, as child was so clumsy in his movements. September 28, 1875, jacket applied. Patient is to be taken home and given tonics, a nutritious diet, and plenty of out-door exercise. November 3, patient returned much improved. Cheeks rosy. Suspended, and a new jacket applied. February, 1876, parents write that child is well. . . . June, 1876, a physician from the neighborhood stated that child was perfectly consolidated.

Duration of treatment about nine months. Consolidated with slight deformity. Two jackets used.

Case 12.



Spinal Curvature before and during Suspension.

Case 13. Anna D. S., Chambersburg, Pa., aged eight years.

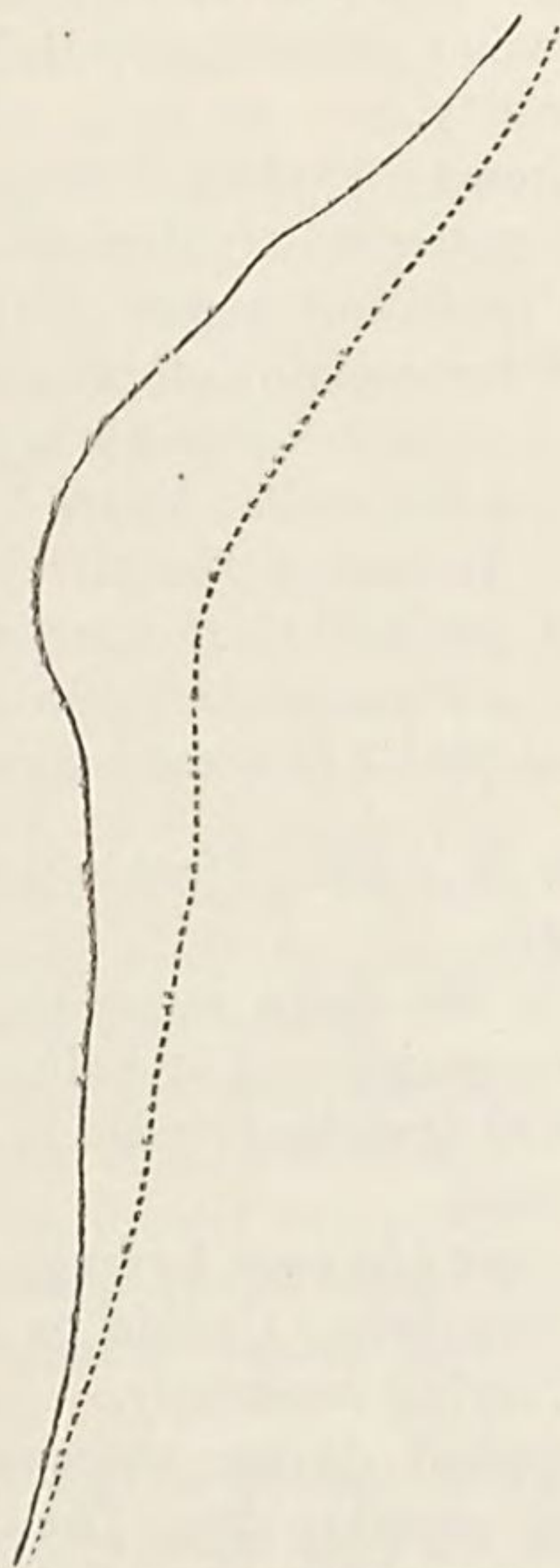
Parents healthy. Child healthy until five years of age, when she was pushed from a curb-stone, and fell upon her back, among a lot of loose cobble stones. Shortly after this, she complained of more or less pain about the abdomen and right side. Mother states that she was not nearly so lively as before the fall; would cry out at night, could not lie upon her back without great pain, and was more comfortable while lying upon her stomach. Was examined by two physicians who could not decide on the disease. In March, 1875, undue prominence of spine first noticed. Taylor's brace was applied, but father thinks deformity increased.

October 29, 1875, patient first seen, having spondylitis of dorsal region. Suspension reduces deformity.

My assistant, Dr. Robert Taylor, applied plaster-of-Paris

jacket during suspension, which gave complete relief. Child remarked that the jacket was better than all the iron braces. Child returned home, and Dr. Samuel G. Lane and her father applied fresh bandages whenever necessary. Letter dated March

Case 13.



Spinal Curvature before and during Suspension.

19, 1879, states that patient's general health is good, and that she is equal to anything which other children do. Should say, from contents of letter, that consolidation had taken place. Under treatment about three years and seven months.

Remarks.—*Vide* published history, "Sayre on Spinal Disease, and Spinal Curvature," p. 34.

Case 14. Wm. W. F., Whitehall, New York, aged five years. Healthy parents. Child healthy till June, 1875, when dragging of right foot was noticed. July 2, 1875, he was brought to

me, having hip-disease in the first stage. He also had phimosis. I applied my long hip-splint and operated for phimosis. Nov. 8, patient returned with symptoms of spondylitis, which I determined existed in the cervical vertebræ.

Nov. 8, 1875. Patient first seen, having spondylitis of the cervical vertebræ. Slight posterior curvature. Pressure upon head causes pain. Suspension relieves patient from pain and obliterates posterior deformity.

Plaster-of-Paris dressing applied during suspension, carrying the bandage well up posteriorly. Nov. 9th, jacket removed on account of causing pain, and a new one applied. Nov. 10th, child better, but still complains of pain between the scapulæ. Patient needs a head support. Dec. 12th, carrying plaster bandage up so as to support the neck. March 1, 1876, child has been using wheel-crutch. Disease of the vertebræ to all appearance cured, consolidation having taken place with slight deformity in about ten months. Three jackets used.

Remarks.—At this time I had not begun to use the jurymast.

Case 15. Charles W., Fort Washington, New York, aged three and a half years.

About May, 1875, fell down seven steps upon a flagstone. Shortly afterward he complained of indigestion, and of pain in the epigastrium. Was examined by Dr. S. A. Raborg, who diagnosed Pott's disease.

Nov. 21, 1875, patient first seen, having spondylitis of eleventh and twelfth dorsal vertebræ. Unable to stand without assistance. Very fretful, crying constantly.

Plaster jacket applied during suspension, which afforded great relief. Patient ceased to cry. Dec. 31, plaster jacket renewed; child perfectly comfortable. This jacket was worn till March 27, 1876, when it was removed. A little redness was found over the eleventh and twelfth dorsal vertebræ, which was protected by felt plaster, and a new plaster jacket applied, which gave him perfect relief and enabled him to walk without other support. Aug. 25. Plaster jacket soft; new one applied. Could stand erect without jacket and bear quite firm pressure on head while standing. June 11, 1877. No pain upon compression or concussion. Applied corset with lateral supports for protection.

Consolidated without deformity in about one year and seven months. Four jackets used.

Remarks.—April, 1878. Remains well.

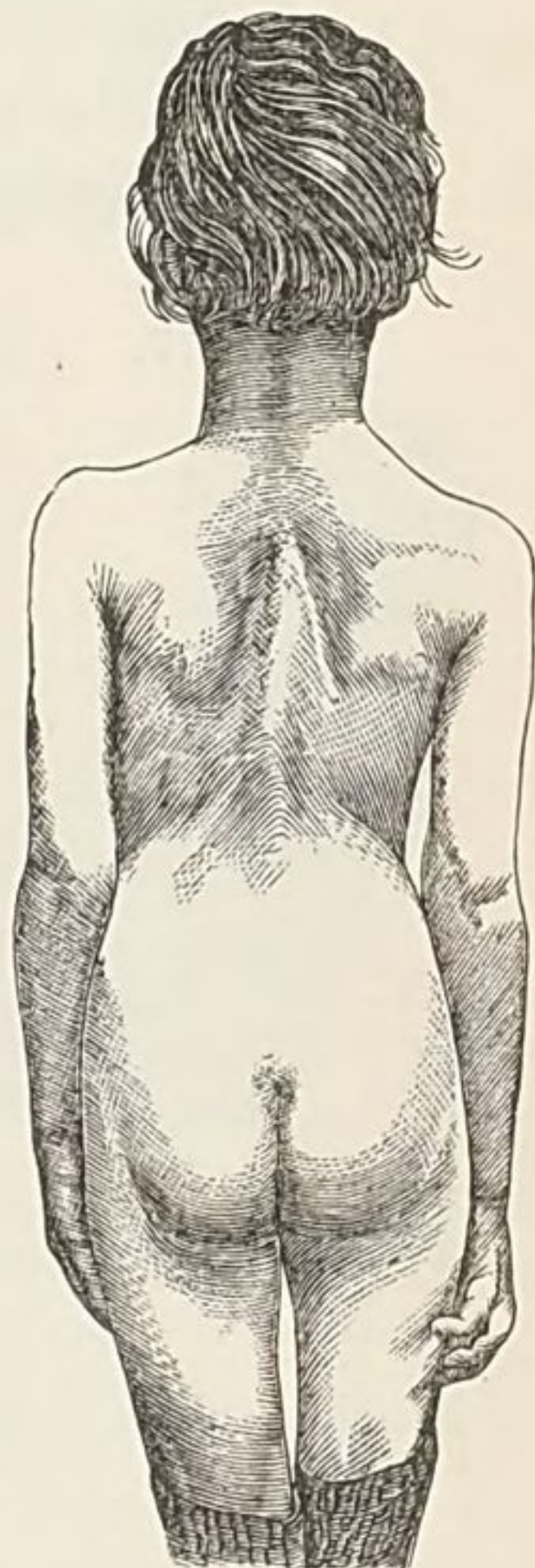
Case 16. Hattie A. M., Fort Wadsworth, aged four and a half years.

Parents healthy. About November, 1869, patient fell from the second story of a house, striking upon her nates, but apparently sustained no injury. In January, 1870, was taken sick with inflammation of the bowels, which lasted for two months, but she remained feeble for a year. For about six weeks, in spring of 1871, she could not use left foot at all, owing, it was thought, to a sprain. About November, 1871, began to have pain in stomach, which gradually increased in frequency. This pain was aggravated by jolting, riding, etc. Afterwards walked with hands upon hips. Treated for worms, kidney trouble, etc. About the end of August, 1872, undue prominence of spine was noticed, and patient was ordered to lie still in bed. November 11, 1872, patient was brought to me, and I applied a Taylor's brace, which was worn until December, 1875, but without permanent benefit.

Dec. 18, 1875, patient first seen, having spondylitis of tenth, eleventh, and twelfth dorsal vertebræ. Also, lateral curvature. Severe pain in side, caused by the slightest jar to the body. General health poor. Highly nervous state.

Patient suspended, and a plaster-of-Paris jacket applied. "The first and immediate effects were the total disappearance of the pain, and an apparent increase of strength." (Patient's father.) Jacket first applied was worn until about the 15th of February, 1876, during which time steady improvement was noticed. March 7, 1876, second jacket applied, which held patient in a much more erect position than formerly. Increased strength, quite free from nervousness, exercises freely, head carried more erect, right shoulder, formerly badly drooped, is assuming its natural position. November 11, 1876, new jacket applied, and made into corset, to be worn as a protection, as patient is consolidated in improved position, having been under treatment eleven months. *Vide* Fig. 10, from photograph.

Fig. 10.



Four or five jackets used.

Remarks.—*Vide* fully published history, "Sayre's Spinal Diseases and Curvature," p. 29. Patient last seen in fall of 1877. She was well, wore no spinal support, and was a robust, active girl.

Case 17. Theresa C. E., No. 131 Madison Street, New York, aged five years.

Mother healthy; father died of phthisis. Child healthy until fall of 1875. Mother states that while she was playing on a cart

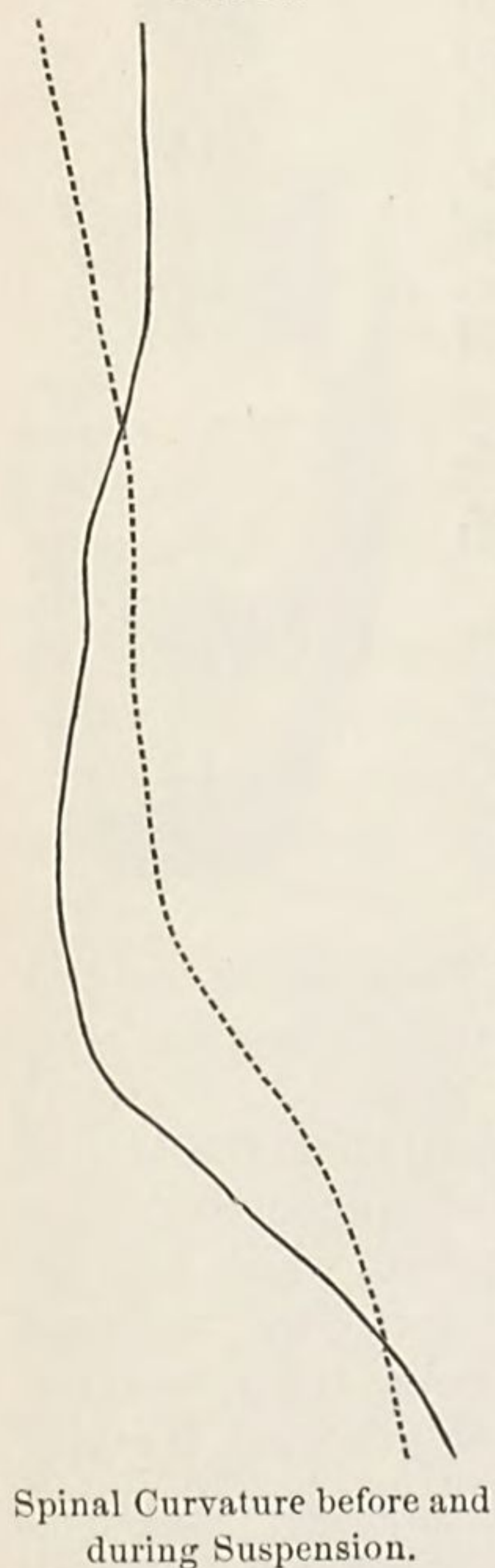
with other children she fell to the ground, striking upon her back. A short time after this she began to complain of pain while being dressed and undressed, and also to stoop when walking. Was taken to Dr. Yale in October, 1875, who pronounced it "Pott's disease" in lumbar vertebræ, and advised Taylor's brace.

Jan. 12, 1876, patient first seen, having spondylitis of lumbar vertebræ. Unable to walk without being supported. Suspension diminishes deformity. Stands as shown in Fig. 11, taken from a photograph.

Applied plaster dressing while child was suspended. Perfectly comfortable. Walked without other support, which she had been unable to do since Oct. 1875. Jacket worn until April 25, when it was removed, as she complained of its being too tight. There was a slight excoriation on the side of the vertebræ, produced by a strip of adhesive plaster. She was not redressed until May 2d. May 23, jacket removed, and slight excoriation found. New jacket put on May 30th. Position as seen in Fig. 12. July 17, new jacket. Continued improvement. Sept. 4, 1876, new jacket applied. No tenderness whatever except when pressing upon the sides.

May 15, 1878. Six jackets applied since last date. Patient is now perfectly consolidated, though with some deformity, both

Case 17.



Spinal Curvature before and during Suspension.

posterior and lateral. Has been under treatment two years and four months. Lateral curve due to absorption of the sides of

Fig. 11.



Fig. 12.



the vertebræ. July 15, 1878, new jacket applied for protection. Eleven jackets used.

Remarks.—*Vide* published history, Sayre's "Spinal Disease and Spinal Curvature," p. 36.

Case 18. Geo. W. C., 16 W. Fifty-third Street, aged six years.

In the summer of 1876, while in Switzerland, he fell out of bed, striking his back against the edge of a crib, which hurt him very badly at the time. Some weeks after he began to complain of pain in the stomach and bowels, which was attributed to indigestion. Was recommended to the different waters in Germany by various physicians. In the autumn he had another severe fall, and soon after began to complain of pains in one knee. These pains were slight at first, but increased week by week until he began to have great difficulty in walking. Hip disease was suspected and for this he was brought to me.

March 1, 1876, patient first seen, having spondylitis affecting the eighth, ninth, and tenth dorsal vertebræ, with marked prominence. Intense pain upon pressure of the sides against the ninth ribs. Peculiar walk and stiffness of the spine. Suspension

almost obliterates deformity, and relieves the patient from his catching respiration.

Suspended the patient and applied the plaster jacket. Pain in stomach and bowels and catching respiration relieved at once. His health and strength improved daily, and in a month he could exercise and walk with great freedom. He attended a fancy dress ball in costume (see Fig. 13) and no one suspected

Fig. 13.



he had Pott's disease, or could detect any difference in his movements from those of other children. June 12. Jacket removed in the presence of the late Prof. Darby, of New York; Drs. Benham, of Pittsburgh; Formento, of New Orleans; Logan and Williams, of Georgia; Cullen, of Richmond; and some others who happened to be in the office at the time. Slight tenderness still existed upon firm side-pressure upon the ninth rib. New jacket applied. Jan. 15, 1877. Entirely well; no deformity. Under treatment about eleven months.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Curvature," p. 37.

Case 19. Edward B., Jersey City, aged three years and two months. (Brought by Dr. Robert Taylor.)

Parents healthy. Child strong and robust until August, 1875,

when a door fell upon him while he was playing. A month afterward child complained of pain in his chest.

February 5, 1876, patient first seen, having spondylitis of second, third, and fourth dorsal vertebræ. Unable to walk without support.

Suspended patient, and applied plaster jacket in the ordinary way. He was then laid upon his face in the horizontal position, and his head extended so as to make him perfectly comfortable. A plaster bandage was now carried from the body of the jacket up the back of the neck to the occiput, and upon the head, following the curve of the neck. This was secured at the top with a band around the forehead. March 1. Old dressing removed, and new one applied. Improvement. May 4. New jacket. July 21. New jacket with jurymast applied, which affords much greater comfort to patient. Nov. 1877. Since last date, the jackets have been reapplied as often as necessary. To-day, old jacket removed, new one with jurymast applied. Continued improvement. March 19, 1878. Jacket cut off, and patient sent home for a bath. March 25. New jacket and head-rest applied at college clinic as a means of protection.

Consolidated with slight deformity. Two years and three months.

Remarks.—This is the first case in which I made extension upon upper portion of spine by carrying plaster dressing upon neck and back of head. The efficacy of this method of application is obvious, on account of the absolute rest and support given to the entire column. The objection to using gypsum bandages for this purpose is principally on account of its appearance. It is probable that porous felt splint passing up back of neck and head would answer better.

Case 20. W. A. L., 127 Morton Street, Jersey City, aged four years. (Sent by Dr. Craig.)

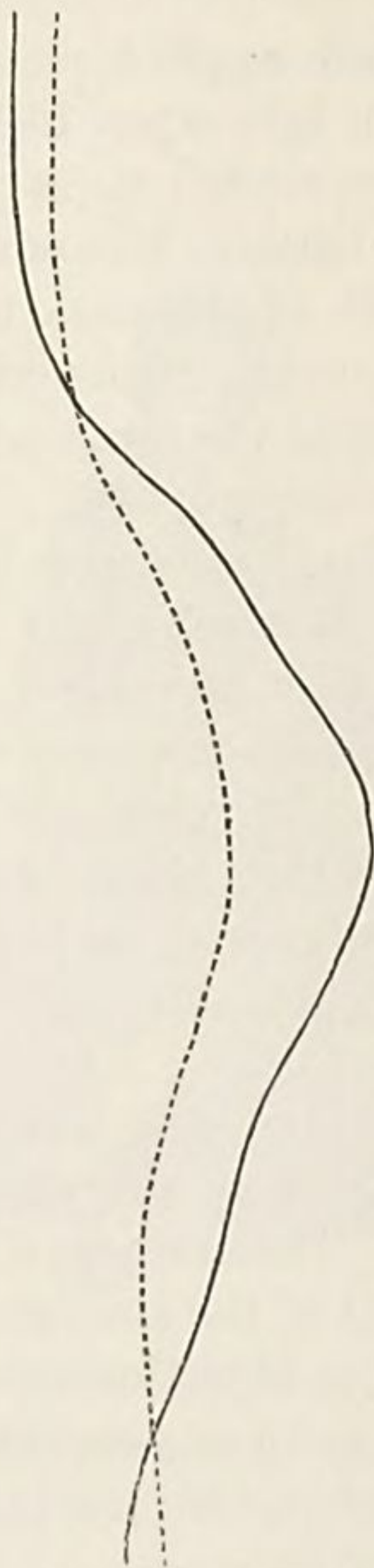
Disease has existed since August, 1874, and was caused by a fall down stairs. A Taylor brace was applied July 20, 1875, which has been worn ever since. At that time deformity very slight (as the parents say).

February 10, 1876, patient first seen, having spondylitis of eighth, ninth, and tenth dorsal vertebræ.

Suspended patient and applied plaster-of-Paris jacket, after which he could walk, and was comparatively straight. May

10. Has been perfectly comfortable since application of bandage. Exercises freely. No indigestion or pain, of which he formerly complained constantly. July 1. Much improved. New jacket

Case 20.



Spinal Curvature before and during Suspension.

applied. October 1. Consolidation apparently complete, but another jacket applied as a means of protection. Jan. 1, 1877. Perfectly well, with slight curve.

Under treatment about ten months. Three jackets used.

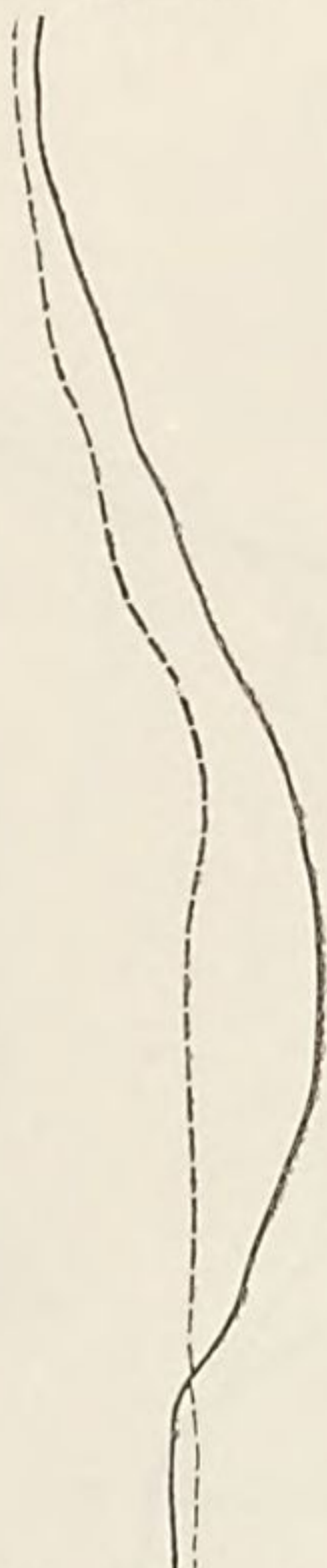
Remarks. — *Vide* "Sayre on Spinal Disease and Curvature," p. 41.

Case 21. Henry P., Dover, N. J., aged three and a half years. Received a fall. Was healthy previously. Disease first noticed about March, 1875.

March 16, 1876, patient first seen, having spondylitis of dorsal region. Suspension reduces deformity.

Suspended patient, and applied plaster jacket before class at Bellevue Hospital. Winter of 1876-7 reported improved.

Case 21.



Spinal Curvature before and during Suspension.

Case 22. Annie T. C., Athens, Georgia, aged thirteen years.

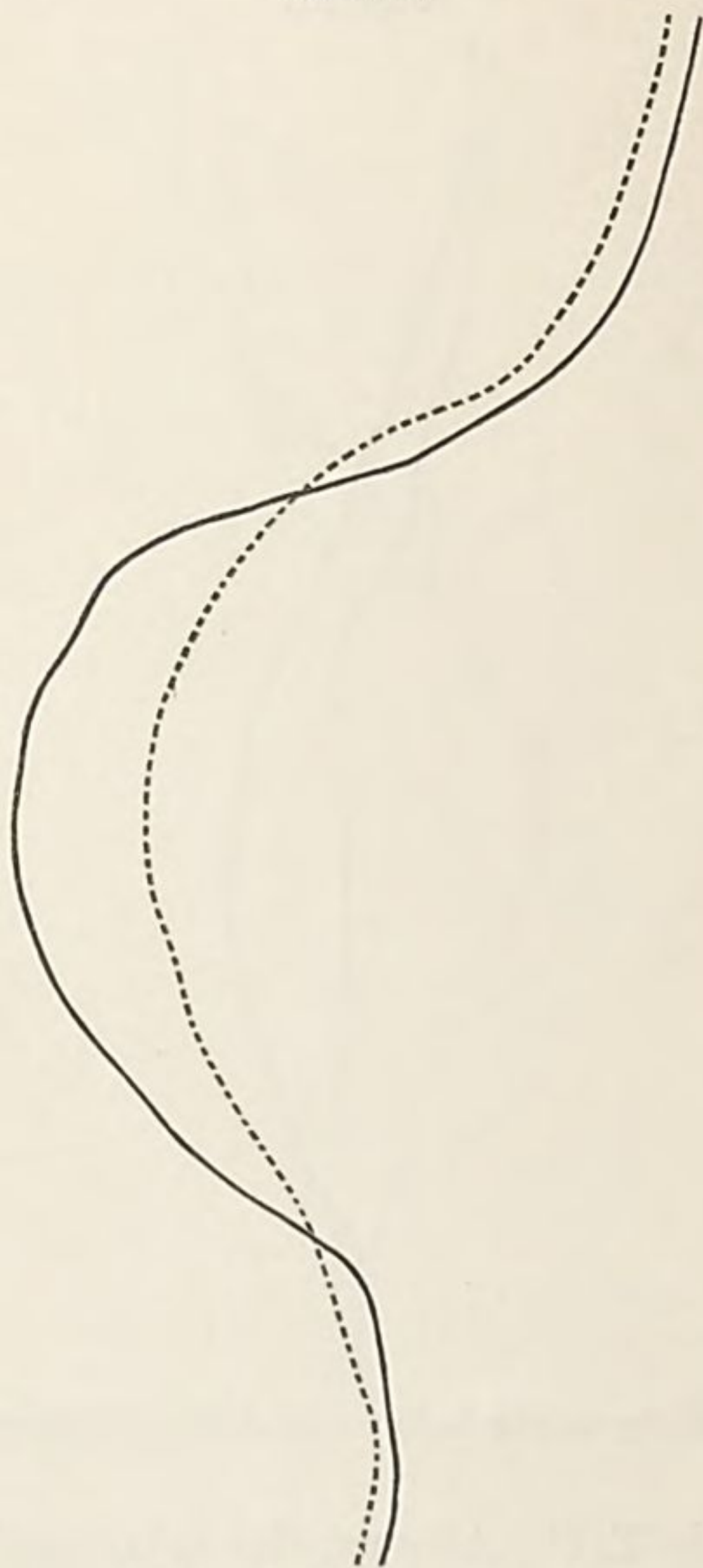
Father and mother dead. Cause of death unknown. At five years of age had a fall, followed by pain in the back and bowels. Three months afterward an undue prominence of the spine was noticed. She was at the Hospital for Ruptured and Crippled fourteen months. Wore Banning's brace, but was finally obliged to abandon it on account of pressure produced. Kolbé's brace was worn for two years. An ulcer made its appearance at the top of each thigh, which, for a time prevented the wearing of any brace.

March 16, 1876, patient first seen, having spondylitis of the sixth, seventh, eighth, ninth, tenth, eleventh, and twelfth dorsal

vertebræ. Suspension reduces deformity. Position as shown in Fig. 14.

Applied plaster jacket during suspension, which was worn with comfort until April 22d, when it was removed on account

Case 22.



Spinal Curvature before and during Suspension.

of the child having the measles. During the time of her wearing the jacket the pain in the stomach after eating, which had previously been a constant trouble, had not annoyed her at all, and her breathing was much freer and deeper when the jacket was on than when she was without it. May 12th. Applied new jacket, which materially improved her position. (See Fig. 15.) August 29th. Much improved; no pain on pressure. February 24, 1877. Jacket applied four times since last date. New jacket applied to-day. May 3, 1877, patient returned home, cured,

with deformity lessened. Under treatment thirteen and a half months.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 49.

Fig. 14.



Fig. 15.



Case 23. Thomas C., 212 West 36th Street, New York, aged seven years.

Mother states that he is a very nervous and excitable child. When three years old fell down a flight of stairs, since which time he has complained of pain in the epigastrium, and sometimes in his back. While still confined to his bed, mother noticed "bunch" on his back, which was painful. Has been under treatment for four years. Has been to a Philadelphia hospital; also the Hospital for Ruptured and Crippled, New York, and Dr. Sweet, of Newark, has seen him.

March 16, 1876, patient first seen, having spondylitis of seventh, eighth, and ninth dorsal. Is tolerably well nourished. Unable to stand without support. Position, as shown in Fig. 16, taken from photograph. Concussion of spine gives great pain. Suspension relieves deformity considerably.

Plaster jacket applied during suspension. Boy returned May 20, when a new jacket was applied, and worn until August 31. New jacket applied September 5. Patient very much improved. (See Fig. 17.) November 30, 1877. Patient has had

Fig. 16.

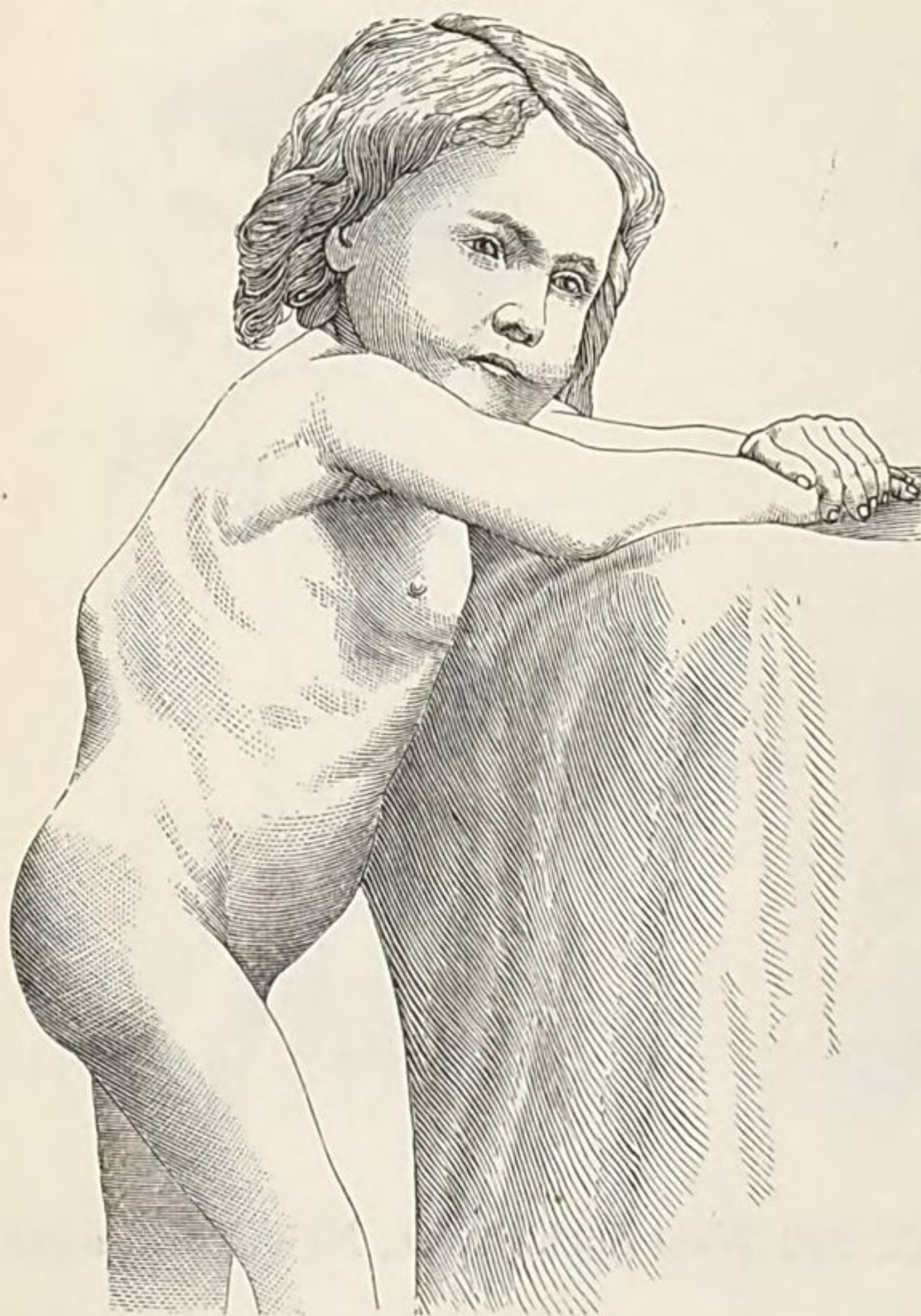
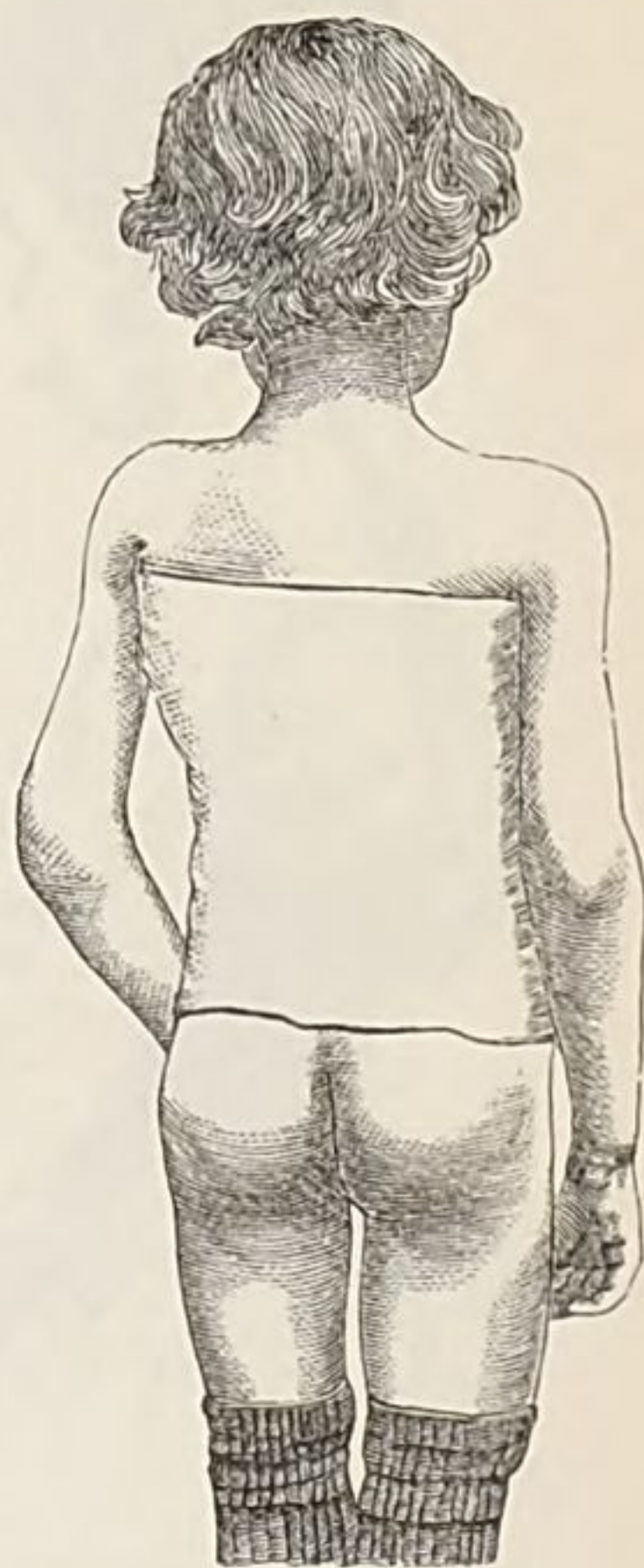


Fig. 17.



four new jackets since last date. No pain upon concussion, compression, or bending in any way. Deformity scarcely perceptible. Under treatment one year eight and a half months. Seven jackets used.

Remarks.—*Vide* published history, “Sayre on Spinal Disease and Spinal Curvature,” p. 40.

Case 24. Edith S. G., Cato, Cayuga County, N. Y., aged seven years. (Brought by father, Dr. C. A. Groot.)

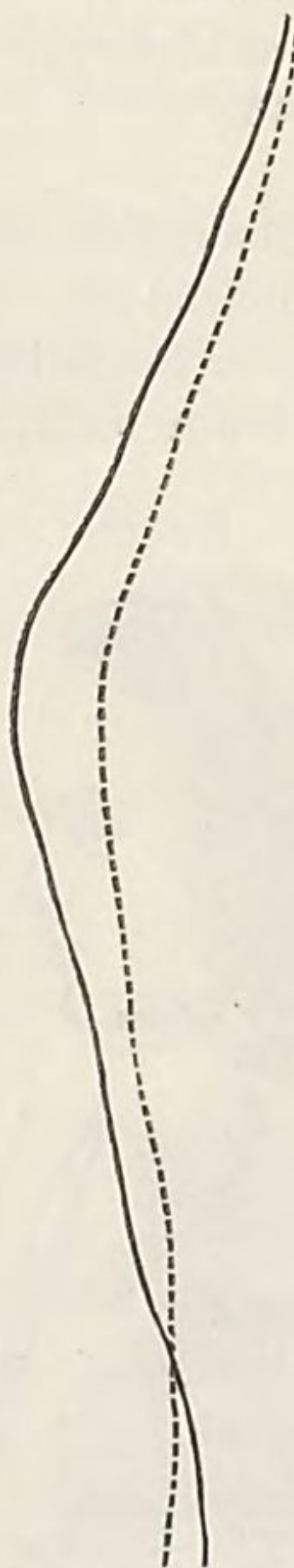
Parents and three sisters healthy. About the middle of June, 1875, child was thrown from a trotting sulky, from which time her disease dates.

March 27, 1876 patient first seen, having spondylitis of

fourth, fifth and sixth dorsal vertebræ, with sharp angular curve. Unable to walk.

Suspended patient, and applied plaster jacket. After which she was able to walk. The following day she went home with her father, who is a physician. A letter from mother, dated March

Case 24.



Spinal Curvature before and during Suspension.

20, 1879, states that when the jacket first applied was removed the child's back was found straighter, and a second jacket was applied by a well-known physician, which was worn four weeks. When second jacket was removed, the deformity was found increased. A third jacket was applied, but curvature continued to increase. Patient lost the use of her lower extremities. Bowels became constipated, and she suffered from incontinence

of urine. Dr. Button, of Auburn, N. Y., induced the girl to try the jacket once more. He applied a jacket which relieved her greatly, but the second jacket applied by him produced a sore on projecting spine, and patient was obliged to take to her bed. He applied a third jacket, but with the same result. At present the child is in poor health, and is unable to walk. She has abandoned all treatment.

Remarks.—*Vide* published history, “Sayre on Spinal Disease and Spinal Curvature,” p. 43.

Case 25. Mary S. W., Bloomfield, N. J., aged twelve years.

Fell when twenty-two months old. Has always been delicate, but never ill. Six weeks after the fall parents noticed symptoms of lassitude and disinclination to walk, and in six months she lost

Fig. 18.



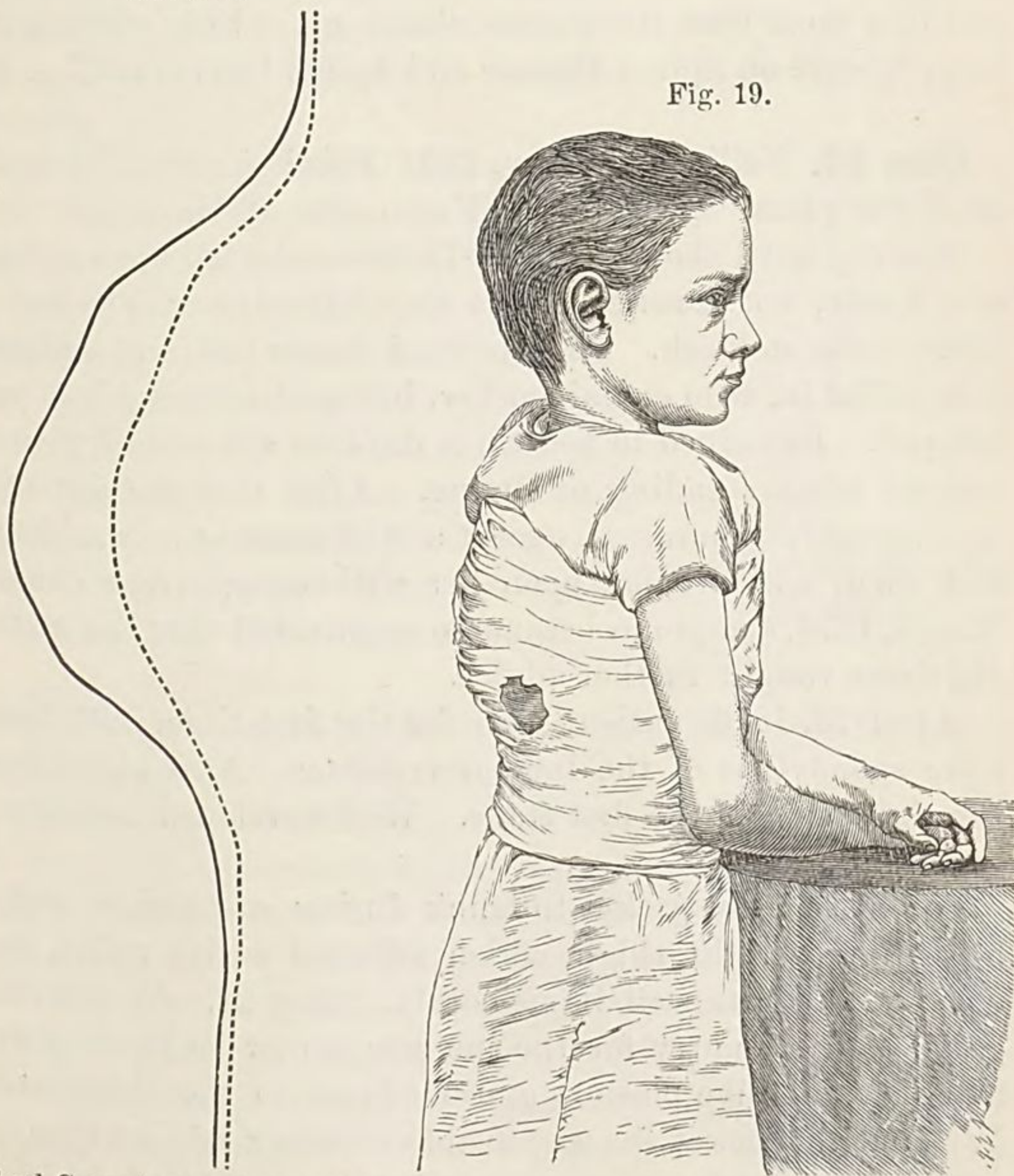
all power of walking, when a swelling in her back was noticed. She was bathed in salt water, and put on cod-liver oil, by advice of Dr. Parker. She was first brought to me March 4, 1868, at

the age of four years, at which time she was unable to stand, and had a posterior curvature of the ninth, tenth, and eleventh dorsal vertebræ. Very tender on vertical pressure, and easier when extended by the feet or lifted by the arms. Advised horizontal posture, and applied Taylor's brace on May 20, 1868. With the brace on she could walk with assistance, and stand without resting her hands upon her knees or any other support. Curvature not quite as prominent. Child was not seen again by me until April 5, 1876. Curvature increased, though she has worn the brace constantly.

April 5, 1876. Patient first seen, having spondylitis of ninth, tenth, and eleventh dorsal vertebræ. Appearance as shown in Fig. 18. Suspension reduces deformity to dotted line. Abscess in back through which several pieces of bone have escaped.

Case 25.

Fig. 19.



Spinal Curvature before and
during Suspension.

Applied plaster jacket during suspension, giving entire comfort to the patient. Cut fenestra over the abscess. May 22, 1876, child improved very much since application of jacket. Abscess has been closed three weeks; position as shown in Fig. 19. Jacket removed and a new one applied without fenestra; this was worn until consolidation had taken place, the patient being under treatment about eight months. Consolidated with considerable deformity. Two jackets used.

Remarks.—This girl was placed under the ordinary mechanical treatment in the early stage of the disease, and faithfully carried out by her father, who was a physician, for eight years, and yet the disease continued to progress, with suppuration and exfoliation of bone, so that when treatment by suspension and the plaster jacket was begun, she was scarcely able to walk. After the application of the first jacket she could readily walk about, and in a short time the abscess closed up. *Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 43.

Case 26. Nellie B. Malloy, 2202 Third Avenue, New York, aged five years. (Sent by Dr. Farrington of Harlem.)

Healthy until about April, 1875, when she fell upon her hands and knees; not severely. The day following was seized with pains in the stomach. This confined her to bed, and a physician was called in, who examined her, but said nothing had yet developed. Remained in bed three days on account of pain experienced when standing or sitting. After this she got up, presenting nothing unusual, except a stiff manner in walking now and then, which came upon her without apparent cause. In March, 1876, symptoms became so aggravated that the attending physician sought further advice.

April 13, 1876, patient seen for the first time, and found to have spondylitis of the lumbar vertebræ. Also hip-disease on the right side in the first stage. Well developed healthy looking child.

Applied plaster jacket to trunk during suspension, and short hip-splint to right thigh, which afforded entire relief, and she could walk quite well immediately. May 22. As the child is going to the country for the summer, a new jacket was applied and new adhesive plasters and bandages to the thigh and leg. Without the jacket she was unable to take a step or stand without support. Afterwards two jackets were applied, which completed the cure.

Remarks.—Fall of 1877 reported well. *Vide* published history, "Sayre on Spine Disease and Spinal Curvature," p. 47.

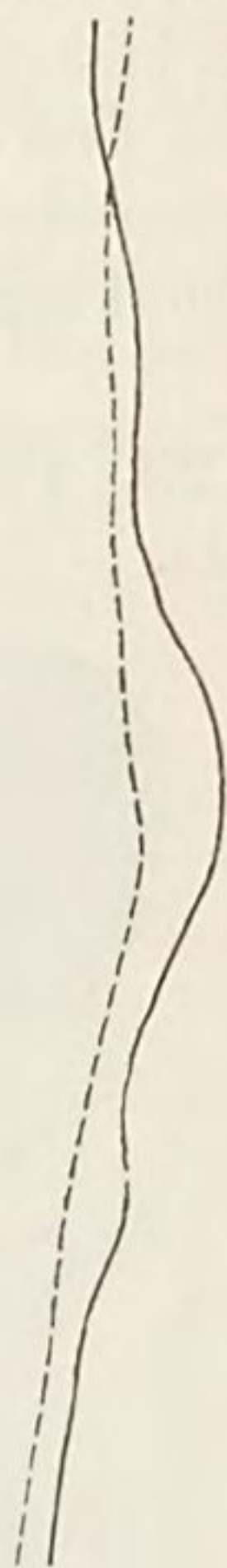
Case 27. Michael D., 113 East Fourth Street, New York, aged two and a half years. (Brought by Dr. Joyce.)

Fell down stairs in October, 1875. Previous to fall was perfectly healthy. Two weeks after the fall it was noticed that patient walked stiffly and carried his head unnaturally. Taken to Dr. Knight, at the Hospital for Ruptured and Crippled, who applied his spinal brace Nov. 20, 1876, which has been worn up to the present time.

April 13, 1876, patient presented himself for treatment, having spondylitis of the dorsal vertebræ. Suspension reduces deformity.

Suspended the patient and applied plaster jacket at my clinic at Bellevue Hospital. Great improvement in position and entire freedom from pain. This jacket was worn about two months when a new one was applied. The following winter the patient returned greatly improved. A new jacket was applied, and he was then to be cared for by his physician. Have not since heard from him.

Case 27.



Spinal Curvature before and during Suspension.

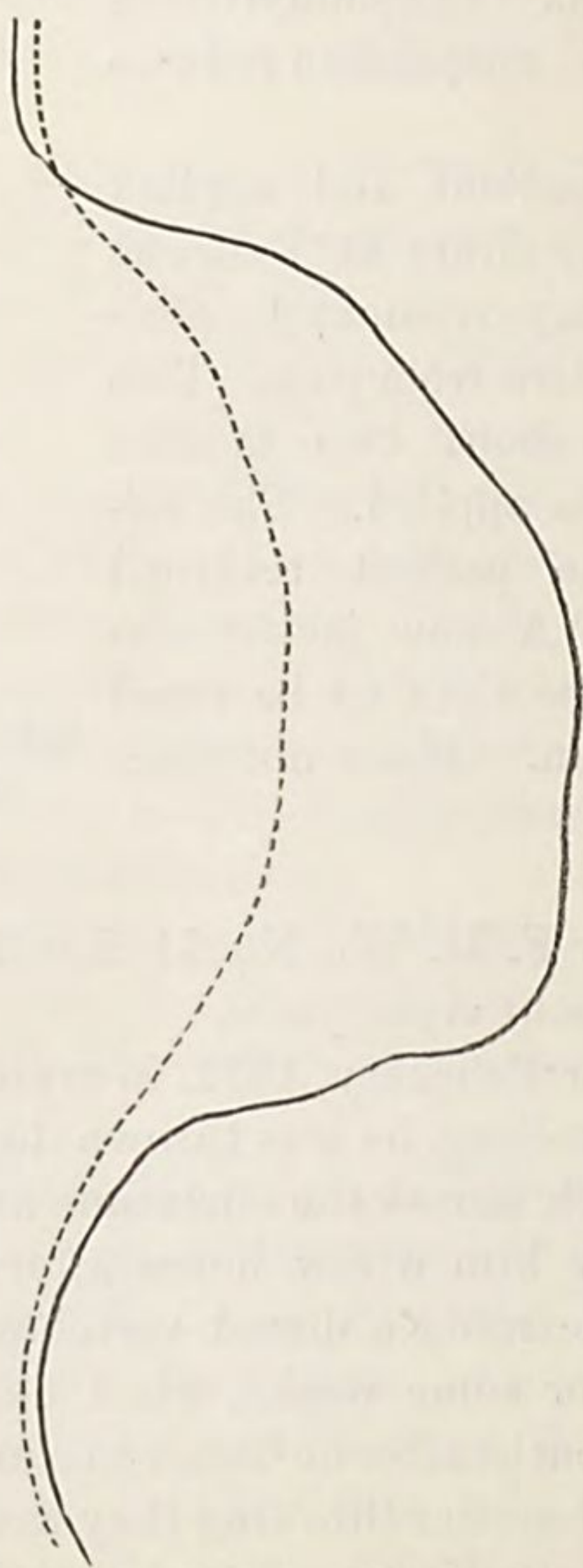
Case 28. Walter F. M. W., No. 51 East Twenty-fifth Street, New York, aged about eight years.

About January or February, 1872, in trying to separate two boys who were quarreling, he was thrown down by one of them, falling with his back across the curbstone and his opponent on top of him. I saw him a few hours afterwards and found a bad bruise over the middle dorsal vertebræ. He was leeches and kept in bed for some weeks, when he was thought to be well. Fourteen months after he began to complain of abdominal pains, and his grandmother thinking they were caused by worms, treated him with domestic remedies; but the child got no better,

and I was called. Found patient suffering from spondylitis of seventh and eighth dorsal vertebræ with a posterior deformity. Taylor's brace was applied, and when adjusted he could walk about. This brace was worn for three years, being adjusted at intervals as occasion required; but nevertheless the deformity increased the kyphotic, and I determined to try suspension and the plaster jacket. April 17, 1876, patient was suspended and a plaster jacket applied, which was worn with comfort until about the first of October, when it was removed and patient found consolidated, with very little deformity, having worn the jacket about six months.

Case 29. Chas. E. Webster, Binghamton, N. Y., aged nineteen years.

Case 29.



Spinal Curvature before and during Suspension.

When about three years old he first complained of pain in his back. Knows of no injury. Was then placed under the care of Dr. Wood, of Boston, and has worn corsets constantly up to 1872. Curvature was then more marked than in the dotted line. In the fall of 1873 spinal trouble was aggravated, since which time he has worn a corset.

April 17, 1876, he presented himself to me for treatment, having spondylitis of dorsal vertebræ with great deformity, as shown in Fig. 20, from a photograph. Dotted line shows deformity after being suspended five minutes.

Applied plaster jacket during suspension, carrying a piece up under the occiput, which gave perfect relief. His height was increased three-fourths of an inch by actual measurement. April

Fig. 20.

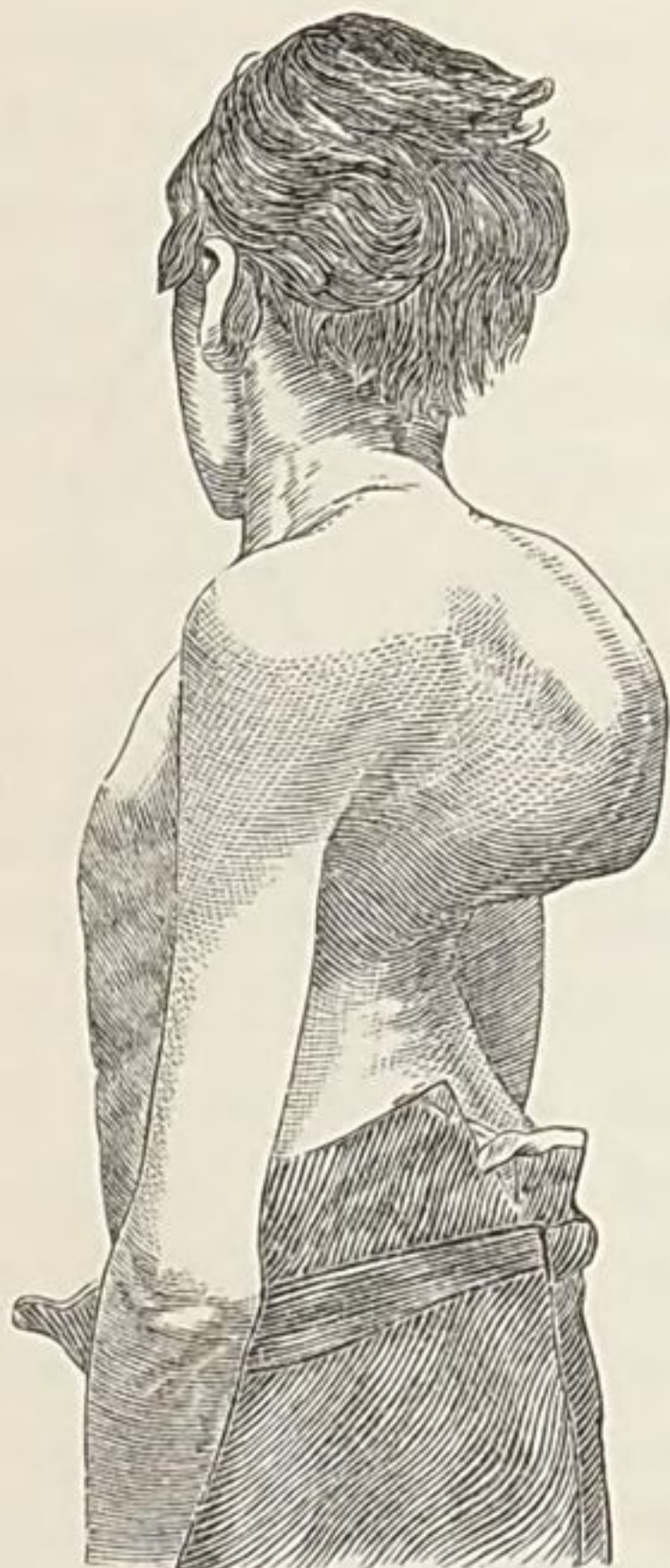


Fig. 21.



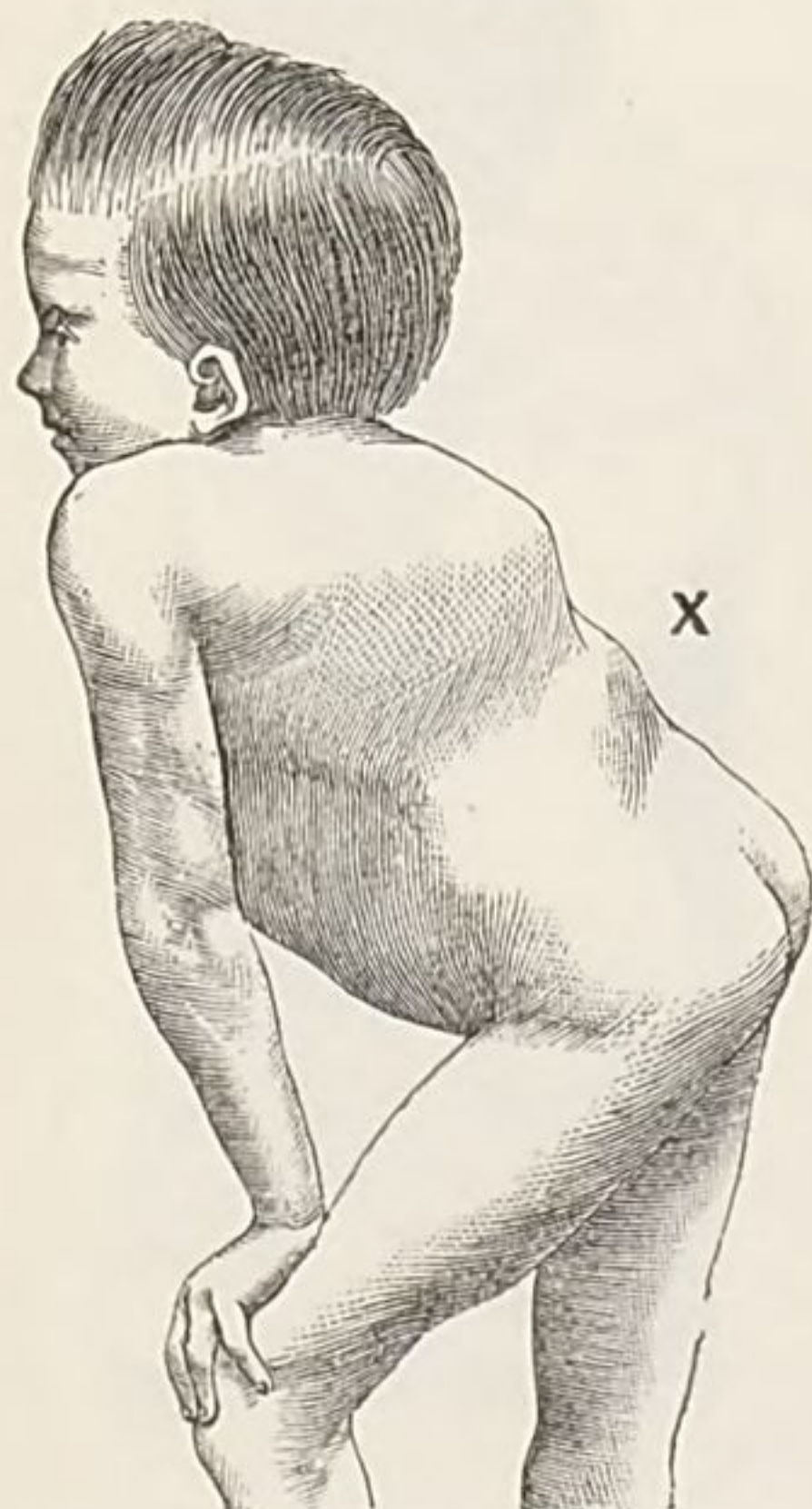
26, the plaster under occiput having cracked, new jacket was applied without head extension piece. May 17, as the jacket causes pain over the hips it was removed, and a new one applied with pads over the anterior superior spinous processes. The pads were removed when the plaster had set, and he said the jacket gave him complete relief from pain. (See Fig. 21.) July 18. Old jacket removed, and a new one applied the following

day. August 25. Jacket removed as it caused pain over hips. New one applied. Patient states that he feels his back is stronger. Sept. 28. New jacket applied for support. Patient consolidated, with some improvement in the deformity, having been under treatment six months. Seven jackets used.

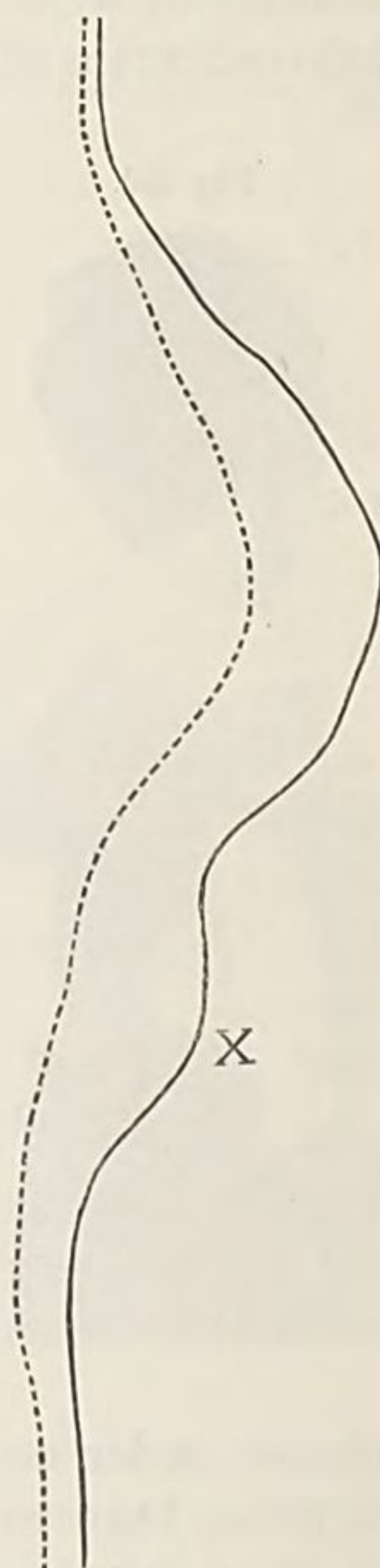
Case 30. Anthony Ryan, 84 Tenth Avenue, New York, aged eight years.

Healthy parents. Child strong. When two and a half years old he had a slight fall from a bed, and soon after noticed

Fig. 22.



Case 30.



Spinal Curvature before and during Suspension.

trouble in his back. Taken to the Hospital for Ruptured and Crippled in September, 1870, and has worn a brace since October of that year.

April 19, 1876, patient first seen, and has spondylitis of middle dorsal and a second projection in the dorso-lumbar region. Position as seen in Fig. 22. Opposite X is a small opening, into which a probe passes to the right three and three-quarter inches, to the left two and a half inches, and one and a half inches in an upward and downward direction. Suspension reduces deformity to dotted line. Unable to walk.

Opened abscess very freely; dressed with oakum and Peruvian balsam. Applied plaster-of Paris dressing, cutting fenestra for the escape of pus, giving him perfect relief, and enabling him to walk without support. Abscess healed in November, after which a second jacket was applied. Jan. 18, 1877. Continued improvement. Wearing jacket without fenestra. March, 1877, patient discharged cured with some deformity, having been under treatment about ten months. March 17, 1879, patient called at office, stating that for two years he has been perfectly well, and has worn no spinal support.

Remarks.—Notwithstanding the iron brace was applied very soon after the first detection of the disease, and worn constantly, the deformity continued to increase and the patient suffered a great deal of pain. *Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 48.

Case 31. Florence B., St. Louis, Mo., aged eight years.

Grandparents and parents very healthy. Two other children unusually strong and healthy. When three years and two months old (July 4, 1864), fell down one step, striking, mother thinks, across an iron footscraper, as she cried out as if in great agony. In a few days complained of wrists and ankles hurting her, and when playing would stop suddenly, put her hands upon the lower portion of her abdomen, and say it hurt. At the end of three weeks spine was examined and two points of tenderness found; one between the scapulæ, the other in the lower dorsal region. Steel brace was applied and patient put to bed. At the end of ten months lower limbs were completely paralyzed and feet drawn back, almost touching calves of legs. Curvature increased. Lower point of tenderness exceedingly sensitive. Leeches applied with relief. Never complained of pain when on her back. Was fleshy. Various physicians were consulted and different braces tried, but symptoms constantly grew worse.

April 28, 1876, patient first seen, having spondylitis of upper and also of lower dorsal vertebræ. (See Fig. 23.) Suspension reduces curve to dotted line. Unable to walk.

While the child was suspended a plaster-of-Paris jacket was applied, which did not give perfect relief; it was removed and replaced by a new one, but this had to be taken off, as it caused pain over the prominent points of the spine. As there was a very sensitive point over the second dorsal vertebra, leeches were used, and with marked success. A new jacket was applied on the 21st of June, and as the disease was so high up, a "Davis's head supporter" in conjunction with it, afforded complete relief. Child walked two blocks, and can sit up, stand, and run about, which she had not been able to do for months. (*Vide* Fig. 24.)

Fig. 23.

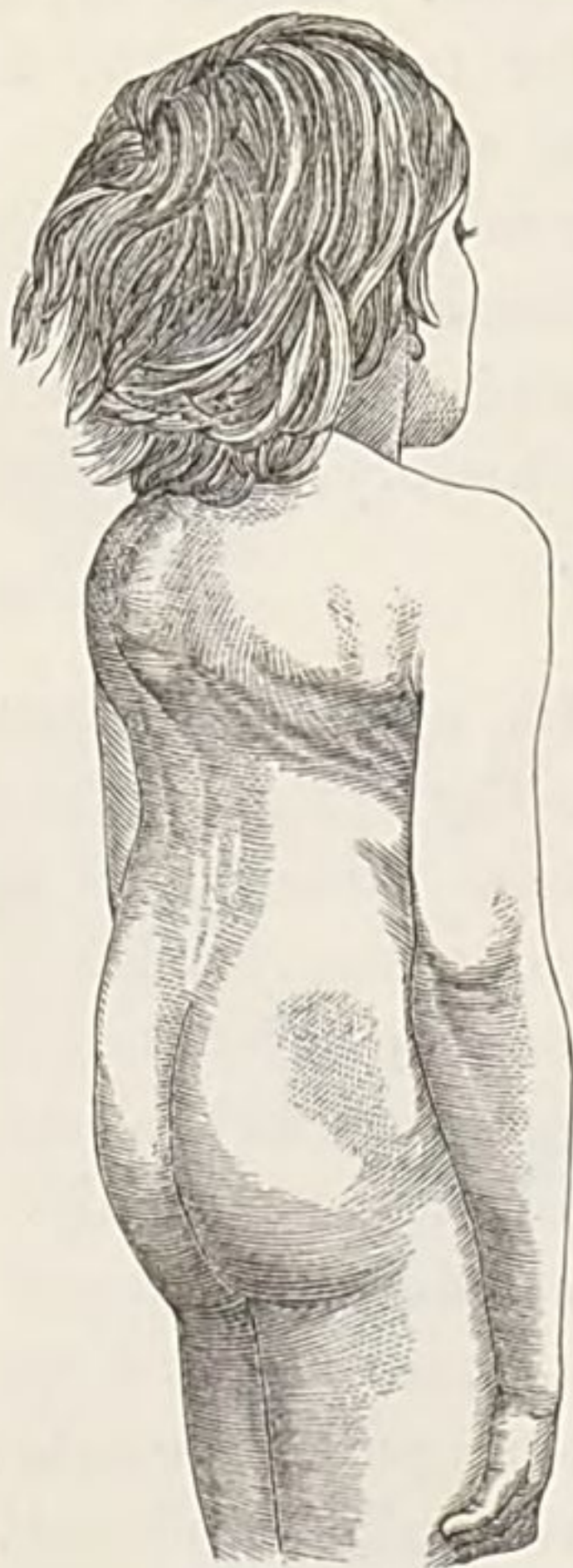


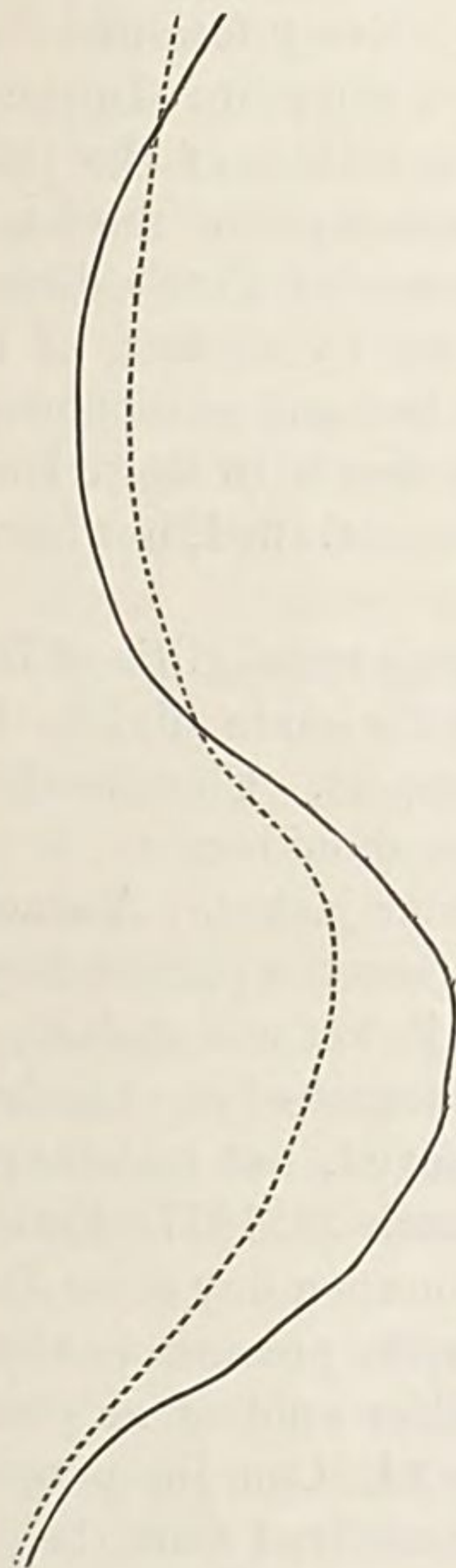
Fig. 24.



Oct. 4. Child has been in the country since July. Has grown stout and is able to take a great deal of exercise without pain or fatigue. New jacket applied to-day. Curvature much diminished. Dec. 24. New jacket applied, but as Davis's head supporter caused her some discomfort a juremast was substituted, which, she says, is more comfortable. Positions as seen in Figs.

25 and 26. Feb. 11, 1877. Old jacket removed, but as old was so comfortable, new jacket and head rest was not applied until Feb. 17, when it was found she was a half-inch taller than when wearing old jacket. Apparently consolidated. Patient was taken home, and in the fall of 1877 mother wrote that child was much worse. Upon inquiry it was ascertained that in their efforts to straighten the child they had made undue extension

Case 31.



Spinal Curvature before and during Suspension.

Fig. 25.



Fig. 26.



upon the spine. Letter dated St. Louis, Dec. 22, 1878, states that patient has not worn a jacket since April, 1878, which makes the duration of treatment two years and eleven months. She steadily improves in strength. Has some curvature, but is unusually active and graceful, and holds herself erect.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 54.

Case 32. Sarah Jean A., M.D., Tinafau, North China, aged twenty-three years. (Brought by Dr. A. B. Judson at the request of Mrs. Dr. Mary Putnam Jacobi.)

Family history good. Patient's health previous to present difficulty was good. In the year 1869 or 1870 was thrown from a horse, and struck upon a pile of stones; suffered pain for a few days, after which it disappeared. Every few months some trivial accident would cause a return of the pain. In the winter of 1874-75 overwork again caused a return of the pain. In March, 1875, had congestion of the meninges of the brain and spinal cord. In April, 1875, a diagnosis of Pott's disease was made by the patient, and confirmed by Dr. Cabott, of Boston, and Dr. Jacobi, of this city. Rest in bed and phosphorus internally used for three months in conjunction with ice to the spine. At the end of this time the ice was discontinued, but horizontal decubitus was maintained for a year.

May 8, 1876, patient first seen, having spondylitis of last dorsal and first lumbar vertebræ. Kyphotic curve slight. Unable to stand but a short time without support. Considerable pain upon downward pressure upon head or shoulders.

Suspended patient, and applied plaster jacket. A crack in it necessitated its removal on May 21, when the patient found she could stand without support. A new jacket was applied, and on the following day returned home, a distance of one hundred and fifty miles. September 8, jacket removed, but none applied as support was deemed unnecessary. March 28, 1877. Patient has been walking or standing five or six hours a day since January. Bones firmly ankylosed. No pain upon pressure in any direction or by any movement. New jacket applied as protection while doing so much walking. May 24. Can jump upon her heels without the least pain. Letter received from the patient, dated Tinafau, North China, January 23, 1878, states that she remains perfectly well, being able to ride long distances over rough roads without causing the slightest pain. Patient was consolidated with very slight deformity in four months.

Remarks.—The conditions in this case were well adapted to promote the excellent result obtained by the treatment. The patient being a young and robust adult, and a female with broad

hips and shoulders, furnished a most satisfactory figure for retaining, by means of the jacket, all that was gained by suspension.

Case 33. Arthur A. H., musician, 194 Varick Street, New York; born in Paris. Aged thirty-one years. (Sent by Dr. V. P. Gibney.)

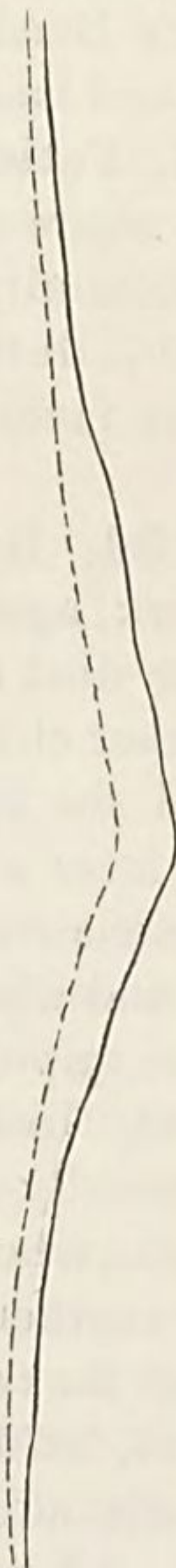
Healthy parents. Patient robust. In 1872 the patient received a blow in the back from a man's fist. At different times has been confined to bed for several days. In February, 1873, admitted to the "Stranger's Hospital." Cupped and blistered. Discharged cured in May of the same year. Worked for two weeks when he was obliged to quit on account of pain in the back. Took to his bed. Treated by several physicians. April 27, 1876, admitted to Roosevelt Hospital, having prominence of the eleventh and twelfth dorsal vertebræ, and unable to stand. Cupped. Discharged, *unimproved*, May 8, and advised to go to Forty-Second Street Hospital, which he did, and saw Dr. Gibney, who sent him to me.

I first saw him May 10, 1876. There was spondylitis of ninth and tenth dorsal vertebræ. Has constant pain in the back, and a girdling pain about abdomen, both of which are relieved by suspension, which also reduces deformity some.

Patient reached the office so exhausted that he had to be carried up stairs, and when applying the jacket during suspension fainted. Taken to Bellevue Hospital; jacket removed; cupped and placed on a water bed. Cupping repeated three times with great relief. June 7.

New jacket applied, which fitted the patient well, and while wearing it he was enabled to walk in an upright position without difficulty. This was taken off in two weeks, as it had broken down, too little plaster having been placed in the band-

Case 33.



Spinal Curvature before and during Suspension.

age. Third jacket applied a few days later, but was cut down on the third day, as it hurt the patient's hips. During its application he fainted. The fourth jacket was applied at my office. Four days after, this cracked and was removed. July 7. The fifth and last jacket was applied at my office. This jacket was a good fit, the patient being perfectly easy in it. Patient called to see me at the West End Hotel, Long Branch, on July 13, and I did not recognize him. His form was erect, and his face florid with the ruddy hue of perfect health. He stated that he was returning from Philadelphia, where he had played the cornet in Gilmore's Band at the Centennial the night before until twelve o'clock, and had to play in the Hippodrome that evening. June 13, 1877. Patient writes from Auburn stating that the jacket he now wears gives him great relief, although applied a year ago. Deformity not increasing. Some pain experienced. July, 1877. Dr. Button, of Auburn, speaks of the condition of the patient in favorable terms.

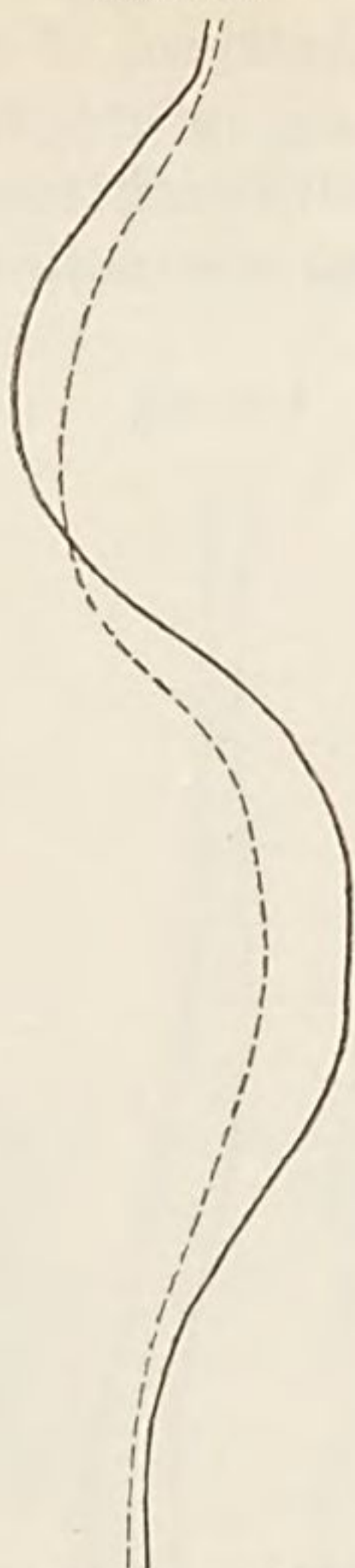
Case 34. Helen Louise V., 3 East Twenty-seventh Street, New York, aged nine and a half years.

Father died of cancer of the liver; mother died of phthisis. Three other children of the same family are healthy. When two years old she fell from a bed, striking upon a stone floor. Six months later a small "bunch" appeared upon her back. Pain in epigastric region. Treated by Dr. Fidel, of Rome, for Pott's disease, and also in Paris by Baron Gros. Under their treatment she improved until she was three years old, when she fell again, this time down stairs, ten or twelve steps, after which the disease rapidly advanced. Patient was seen by Drs. Poore and Vermilyea, who applied Taylor braces, one to be worn during the day and another during the night. Both lower extremities were paralyzed for two years; has recovered partial use of limbs.

May 13, 1876. I saw patient for the first time. She then had spondylitis affecting upper dorsal vertebræ. Suspension does not reduce deformity of diseased part of the spine, but it does reduce the compensating curve. Partial paralysis of both lower extremities; unable to walk or stand. Weight, thirty-three pounds, with brace and clothes on.

During suspension of patient applied plaster jacket over a skin-fitting knit shirt, which retained her in the improved position secured by suspension. June 26th. New jacket. No pain

Case 34.



Spinal Curvature before and during Suspension.

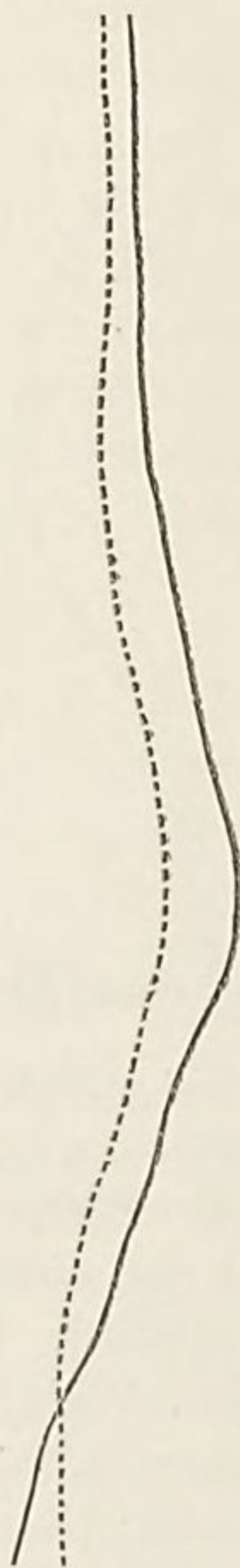
since the application of the first jacket. October 6th. Can stand and walk; has a good appetite, and is growing stout. New jacket with juremast applied. Perfect comfort. Jan. 11, 1877. Greatly improved in strength and ability to walk. March 10th. New jacket, with head-rest, applied. Weighs thirty-seven and a half pounds (net). April 18th. Weighs forty-one pounds. New jacket advised, and, subsequently, it and three more were applied, which completed the cure; that is, the spine became consolidated, the duration of the treatment being about two years and two months. Patient is obliged to wear iron supporters on both legs on account of paralysis. Nine jackets used.

Remarks.—Patient was seen May 29, 1879, when it was learned that for three months previously she had been running up and down three flights of stairs without any assistance.

Case 35. Elvira A., East Thirtieth Street, New York, aged twelve years (niece of Dr. Arango, of New York, by whom she was brought to me).

Father healthy; mother's history passable. Cause unknown. When eight years old complained of more or less pain about the spine, but nothing wrong in appearance was noticed until two years later, when a small knuckle about last dorsal, and first and second lumbar vertebræ was noticed. Horizontal position

Case 35.



Spinal Curvature before and during Suspension.

has been maintained most of the time since deformity was noticed, notwithstanding which the curvature, Dr. Arango says, has increased.

May 20, 1876, patient first seen, having spondylitis of dorso-lumbar junction. Great pain upon walking; is obliged to support herself with a crutch. Could not stand without support. Position as seen in Fig. 27, from photograph.

Plaster-of-Paris jacket applied during suspension, giving perfect relief, and a marked improvement in her figure. As soon as "set" she walked without other support. June 3. Constantly improving. Menstruated for the first time since last date. Breasts have developed so as to necessitate the cutting out of the jacket in front of the top. Position as seen in Fig. 28. July, 1876.

Fig. 27.

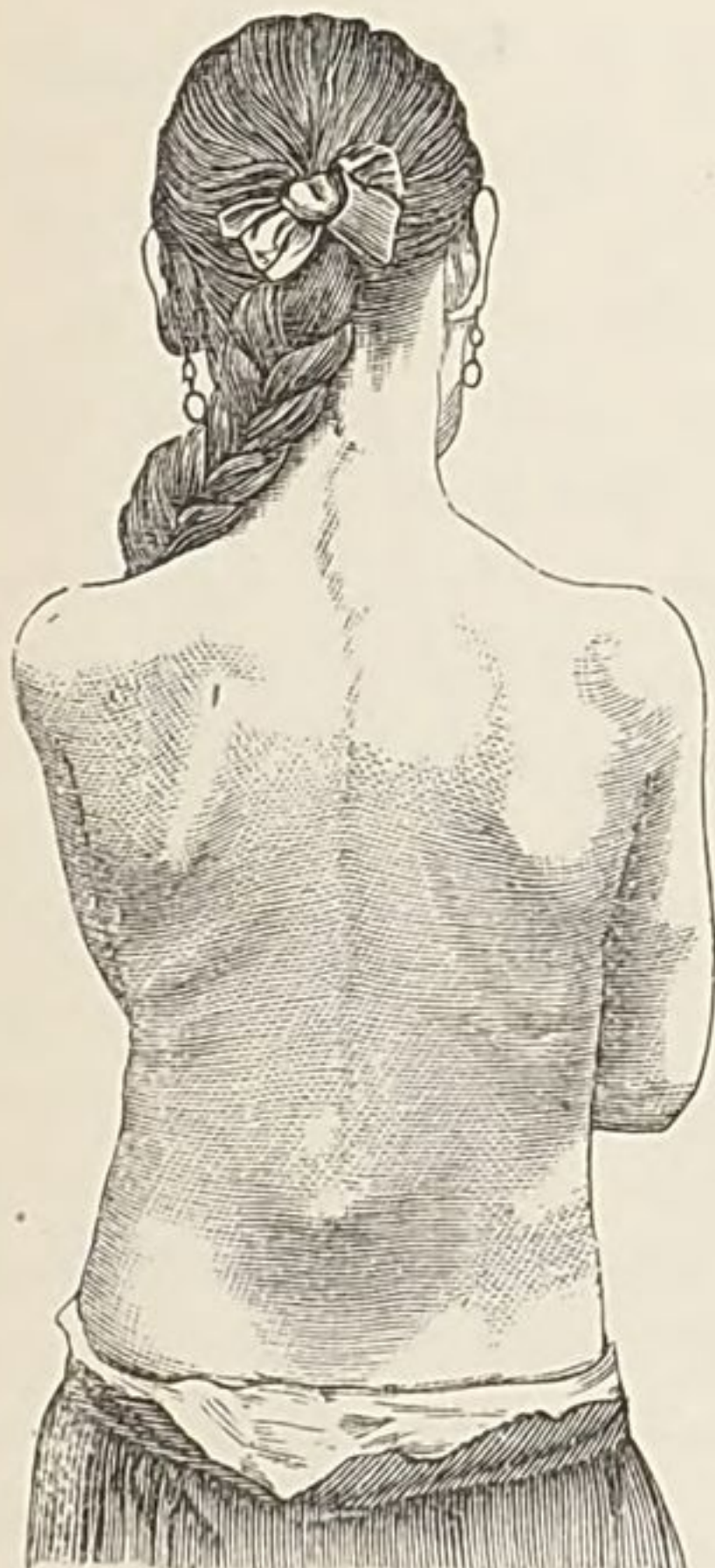


Fig. 28.



Second jacket applied and worn until Oct. 1st, when consolidation was complete, with very slight deformity, treatment having lasted four months. A third jacket was applied merely as a protection.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 59.

Case 36. George A., 819 Second Avenue, New York, aged seven years.

Father healthy; mother not so. Patient strong. About the middle of January, 1876, another boy placed his knee against patient's back, and tried to bend him backward. In a few days "lump" upon back was noticed over ninth and tenth dorsal vertebræ. Child was taken to a physician, who recommended

that he should be taken to Dr. Knight's Hospital. This was done, and the patient has been under treatment at the hospital ever since. Has worn a spinal brace all this time, but patient states that it gives him no relief.

May 24, 1876, patient first seen, having spondylitis affecting ninth and tenth dorsal vertebræ. Position as seen in Fig. 29, from a photograph.

Fig. 29.

Case 36.



Spinal Curvature before and during Suspension.

Child suspended and a plaster jacket applied, at Bellevue Hospital, before the class; but, as he cried and was entirely uncontrollable during the operation, it was removed at once. Subsequently another jacket was applied, and worn for several months with marked improvement. Latterly he was placed in Bellevue Hospital, where he has undergone a variation in treatment with nearly every change of visiting surgeon. Later, he was placed in the Hospital for Ruptured and Crippled. In a letter from Dr. V. P. Gibney, of that institution, dated April

13, 1879, occurs the following: "Father states the boy did well in the plaster jacket until he fell down stairs while in Bellevue Hospital, after which the deformity increased, and a steel brace was applied. Patient re-entered Forty-second Street Hospital, Jan. 8, 1878, since which time he has been wearing a Knight's brace in connection with internal remedies. Is now consolidated."

Case 37. Mary T. B., 348 East Thirty-second Street, New York, aged twenty-six years.

Father healthy; mother died of phthisis. Always healthy up to the winter of 1874-75, when she sustained a severe fall upon the ice. Has never been well since, and the least cold would give her severe pain in the back and stomach. Since January 1, 1875, has been unable to do work of any kind, or walk without assistance.

June 8, 1876, patient first seen, having spondylitis of lower dorsal vertebræ. Position as shown in Fig. 30 from a photograph. She is unable to walk without assistance. Is in constant pain. Sits with hands upon the sides of the chair to remove weight from inflamed vertebræ.

Applied plaster jacket during suspension, which, when "set," afforded her a thoroughly satisfactory support. June 26. Returned, saying she could walk a great deal better, but the jacket was not high enough on her back. Old jacket removed, and a new one applied, going well up to the axillæ. When dry she walked a quarter of a mile, and had a photograph taken (Fig. 31). July 25. Old jacket removed, and July 31 new one applied. Resumed her duties as washerwoman. January 8, 1877. Patient can walk without support, and has but slight deformity. Consolidation apparently complete, but advised to wear jacket a few months longer for security.

Under treatment seven months, when she became consolidated with very slight deformity.

Case 37.



Spinal Curvature before and during Suspension.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 51.

Fig. 30.



Fig. 31.



Case 38. Allen L., Hyde Park, Dutchess County, N. Y., aged five years. (Sent by Dr. Parker, of Poughkeepsie.)

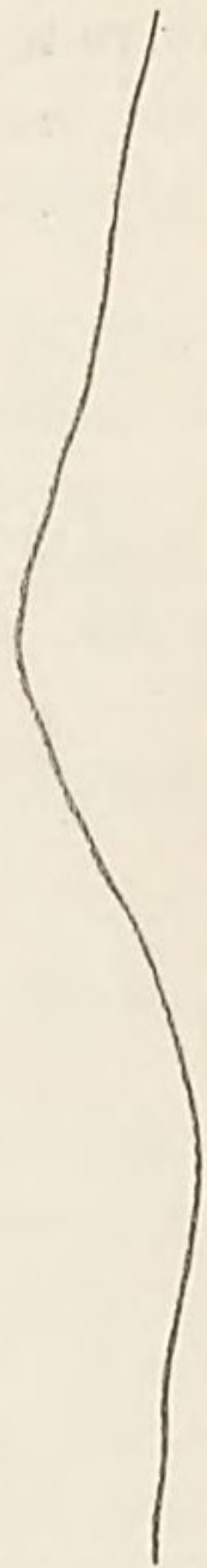
Parents and three other children healthy. Child healthy until March, 1873, when he received a fall. Some weeks after was taken sick and was treated for worms, and later for malaria; lost the power of speech and locomotion, which were gradually recovered from. Walked stiff. Awoke at night crying with pain. Treated the following summer for laryngitis. In September, 1873, a diagnosis of Pott's disease was made by Dr. Thomas. Child was taken to Dr. Taylor, who applied his brace. At this time the deformity was so slight that four physicians declared there was no disease of the spine. At first, child improved under the treatment, but afterwards grew gradually worse, and his spine became excoriated where the brace pressed unduly. In March, 1876, a modified brace was applied with pieces over shoulders and with a breastplate. In reference to this modification of Taylor's brace I would say I have seen many instances where these shoulder-pieces have given rise to a great deal of trouble by undue pressure. Practically, I think it is rather the reverse

of an improvement, for it prevents the proper extension of the spine, which in a growing child tends to increase the deformity. Dr. Taylor doubtless intended that these shoulder-pieces should never rest upon the shoulders, but in reality they do so in many instances.

June 29, 1876, patient first seen, having spondylitis of middle dorsal region. Vertebrae very prominent. Unable to stand. Great difficulty in breathing. On each side of the spine there is a gulch made by pressure of brace-pads, and the skin is excoriated in this locality as well as upon the prominent portions of the ilii.

Plaster jacket was applied during suspension of patient, having previously protected all of the excoriations by surrounding them with soft felt pads, and covering the trunk with a skin-fitting shirt. This gave him great relief. About July 29, jacket was cut down and a fenestra cut the entire length of projecting vertebrae. This was then reapplied, and secured in position with a roller bandage, and worn till Nov. 4, when a new jacket was applied. Has gained in strength; no pain, and can walk without other support. May 18, 1878. Since last date five jackets have been applied at intervals of about four months. Consolidated in about twenty-three months with slight deformity. New jacket applied and cut down May 20, when it was made into a corset to be worn for protection.

Case 38.



Spinal Curvature before Suspension.

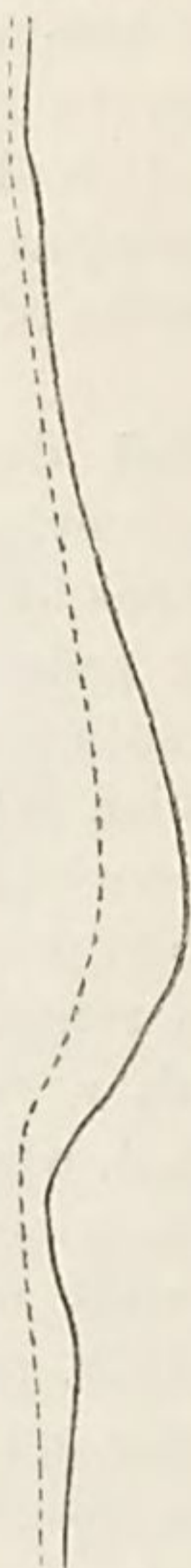
Case 39. W. C. C., 600 West Forty-ninth Street, New York, aged eleven years.

Healthy child. When three years old had hip disease from a fall. Recovered under treatment with good motion. Afterwards was struck by the axle of a wagon on lower part of spine, and not long afterward (about April, 1875) undue prominence of dorso-lumbar vertebrae was noticed. Patient had com-

plained of abdominal pains, and was taken to the New York Orthopædic Dispensary and Hospital, 126 East Fifty-ninth Street; here a spinal brace was applied, which has been worn ever since without benefit.

July 20, 1876, patient first seen, having spondylitis of twelfth dorsal and first and second lumbar vertebræ. Suspension reduces curve to dotted line.

Case 39.



Spinal Curvature before and during Suspension.

Suspended patient, and applied plaster jacket, which was worn with great comfort. September 19th, removed first jacket, and September 23d applied a new one. Position materially improved. Nov. 23, new jacket applied. Spine almost consolidated. February 7, 1877, perfectly cured, nearly straight, in about seven months. Three jackets used.

Remarks.—April 22, 1878. Patient was presented to the New York County Medical Society. He has had no recurrence of his trouble.

Case 40. Frederick E. G., 13 Trinity Place, Albany, N. Y., aged fifteen years. (Brought by Dr. Babcock, of Albany.)

Deformity first noticed when four years of age. Body had been twisted in wrestling, immediately after which he suffered severe pain. Has worn various instruments, and at one time maintained the horizontal decubitus for five months.

July 31, 1876, patient first seen, having spondylitis of dorsal region, together with an exaggerated rotary lateral curvature of the spine. Suspension increases height nearly three inches, due to straightening of lateral curve.

Applied plaster jacket during suspension of the patient. Measurement afterwards showed $2\frac{5}{8}$ inches increase in height. On the evening of the same day started for Albany in company with his physician. Letter from patient, dated March 18, 1879, states that he is wearing no support whatever, and health is good.

Consolidated. But does not state how long he has been so, and therefore duration is not given.

Case 41. Kate C., 629 Third Avenue, New York, aged sixteen years.

Parents healthy. Child healthy until twelve years of age, at which time she had smallpox. Recovered, and a year later began to complain of pain in the left knee. Treated for hip disease, for over a year at Knight's Hospital. When it was discovered that she had Pott's disease and lateral curvature, spinal brace applied and worn, but patient says that the deformity increased gradually.

August 8, 1876, patient first seen, having spondylitis of middle dorsal vertebræ.

Suspended patient, and applied plaster jacket over skin-fitting shirt, and adjusted dinner-pad. This afforded relief from all pain. October 3. Applied new jacket. Patient has been comfortable. April 22. Old jacket removed, and on April 24, 1877, a new one was applied. Has large abscess in left thigh. June, 1877. New jacket; marked improvement. August 3, 1878. Since last date three new jackets have been applied. Steady improvement. April 30, 1879. Since August 3, 1878, patient has had two jackets applied, the last one in January of this year. To-day it was removed, and the patient found consolidated, treatment having lasted two years and nine months.

Consolidated with no posterior deformity, but has slight lateral curve of spine, probably caused by shortening of the limb on the side affected with hip disease.

Case 42. Mary C., Almonte, Upper Canada, aged twenty-five years. (Brought by Dr. Shine, of State Street, New York.)

Parents, six brothers, and four sisters healthy. Patient healthy up to twenty years of age. At this time she began to have pain in the back low down. Afterwards had a great deal of pain in left hip. For about five years she was treated without benefit by Canadian physicians for sciatica, rheumatism, lumbago, etc. She came to New York, and consulted Dr. Shine, who, for the first time, made a thorough examination, and detected Pott's disease with marked deformity, involving the dorso-lumbar junction. He recommended a Taylor spinal brace, which was made and applied by the instrument-maker. Patient states that the brace aggravated her sufferings materially.

August, 1876, I first saw patient. She then had spondylitis affecting the eleventh and twelfth dorsal and first and second lumbar vertebræ. Marked kyphotic curve. Sensation of weakness across abdomen, and between shoulders.

Patient was suspended, and a plaster jacket applied, which relieved her considerably, but not perfectly, it being rather short. This was worn for three weeks, when it was removed, and a new one applied, which afforded her complete relief from suffering. Jackets were applied from time to time as occasion demanded, eight in all being used. In December, 1878, consolidation with only slight deformity had taken place, having required two years and four months, and the jacket she was then wearing was made with a corset, and worn as a protection until February, 1879, when it was abandoned.¹

Case 43. Lilly M., 106 Sixth Avenue, New York, aged four and a half years.

Parents healthy. At two years of age fell from the arms of a little girl, soon after which deformity was noticed. Has worn several steel braces without relief. Complained of pain in epigastrium. Was under treatment in Dr. Knight's Hospital two

¹ July 3, 1879, the patient called at my office, and is in perfect health, wearing no spinal support.

and a half years, but her parents state that her deformity has gradually increased.

August 18, 1876, patient first seen, having spondylitis of middle dorsal region. Unable to walk without support. Pale-faced and emaciated.

Case 43.



Spinal Curvature before and during Suspension.

Suspended, and plaster jacket applied, which afforded great relief to patient. August 21. Child returned, reporting marked improvement. Can walk about the house without other support than that which the jacket affords.

Case 44. Sarah Jane McM., New Jersey, aged seven years.

Mother healthy. Father died of peritonitis, but was previously robust and healthy. Child healthy until four years of age, when she fell down stairs, striking upon her back. At once

began to stoop and wanted to be held. Treated for muscular weakness, and in Knight's Hospital for Pott's disease. Has worn many kinds of braces.

Sept. 4, 1876, first saw patient, who was suffering from spondylitis.

Suspended and plaster jacket applied, which relieved patient greatly.

Case 45. David B. S., Owasco, Shiawassee County, Michigan, aged seven years.

Family history not good. Child healthy until Feb. 1875, when he had a severe siege of scarlet fever, and afterwards sustained a fall upon the ice. The time of this fall marks the commencement of the spinal disease. Was treated by several medical gentlemen, and subsequently at the Indianapolis Institute, where a spinal brace with head-rest was applied, which has been worn ever since.

Sept. 3, 1876, patient first seen, having spondylitis of the sixth and seventh cervical vertebræ, and first, second, and third dorsal vertebræ. Could not walk.

Suspended patient at Bellevue Hospital and applied plaster jacket. Cut off the waistband and leg splints of the instrument child was wearing, and incorporated the head-rest in the plaster jacket. With this applied, child could walk with ease and comfort. September 5, child started home. April 2, 1877, received letter stating that two new jackets had since been applied. No pain in back except when greatly fatigued. Appetite and general health good. Dec. 12, 1877, letter states that jacket was removed in Sept. 1878, having worn them a year. Patient got along well for a time, but recently began to complain of pain in back, especially when tired. About Dec. 1, 1877, a new jacket was applied, but it did not give patient perfect relief. Letter dated March 18, 1879, states that about Dec. 25, 1877, patient began to develop paralysis in lower extremities. Prof. E. C. Franklin, of Ann Arbor, Michigan, now applied jacket, which once more relieved patient. He is hereafter to take charge of patient.

Remarks.—The history of this case emphasizes the importance of the careful examination of the patient by a competent medical man, to positively determine the existence of consolidation before treatment is suspended.

Case 46. Max M., East Sixtieth Street, New York, aged thirty-one and one-half years.

Always strong and active. About March, 1875, began to complain of pain in the chest and over breast-bone. Was greatly depressed in spirits.

September 19, 1876. Patient came under treatment, having spondylitis of sixth and seventh dorsal vertebræ. Tenderness between shoulders upon pressure downward, with very slight undue projection of the vertebræ in this locality.

Cupped him over tender spot, and made two applications of the actual cautery at intervals of some days. Confined him in the horizontal posture for eight weeks. He was then suspended, and a plaster jacket applied, which he wore about four months with perfect comfort. At the end of this time a new jacket was applied, which was made into a corset. Corset was worn about a year and a half, when he was married, at which time consolidation had taken place, with only slight deformity. Two jackets used.

Remarks.—This was one of the first jackets that I made into a corset, and the patient recovered without any increase whatever in his deformity.

Case 47. A. D. N., Newville, DeKalb County, Indiana, aged three years.

In May, 1876, his mother became alarmed on account of the child screaming whenever he awoke from sleep. In June, 1875, small knuckle was noticed in lower part of spine. This was considered unimportant by several physicians. In January, 1876, Prof. Webber, of Cleveland, Ohio, diagnosticated Pott's disease, and placed the patient in a wire cuirass. In July following an abscess was noticed in right thigh.

September 26, 1876, patient came under treatment, having spondylitis of fifth, sixth, seventh, and eighth dorsal vertebræ. Large abscess on outer portion of right thigh.

Opened abscess at Bellevue Hospital, and on September 29th applied plaster jacket during suspension. Two days afterward the child started home.

Remarks.—Never heard from.

Case 48. John J. B., Jr., 226 East Thirty-second Street, New York, aged eight years. (Brought by Prof. J. Bryant.)

Case 48.



Spinal Curvature before and during Suspension.

Strong and healthy until four years of age, when spinal trouble was first noticed. Treated for three and a half years at the Hospital for Ruptured and Crippled.

September 29, 1876. Patient came under treatment, having spondylitis of last dorsal and first, second, and third lumbar vertebræ.

Suspended patient and applied plaster jacket, which was worn entire for six weeks, when it was cut down in front and secured in position by a roller bandage. Jacket was removed at intervals for the purpose of bathing. March 15, 1877. New jacket applied. Large abscess upon outer portion of left thigh opened to-day; discharged freely. Abscess closed in four weeks. Dec. 22, 1877. Patient returned consolidated, with very slight deformity, having been under treatment about fifteen months, three jackets having been applied.

Remarks.—March, 1879. Remains well.

Case 49. Sarah M., 27 West 32d Street, New York, aged sixteen years. (Sent by Dr. Thomas F. Cock.)

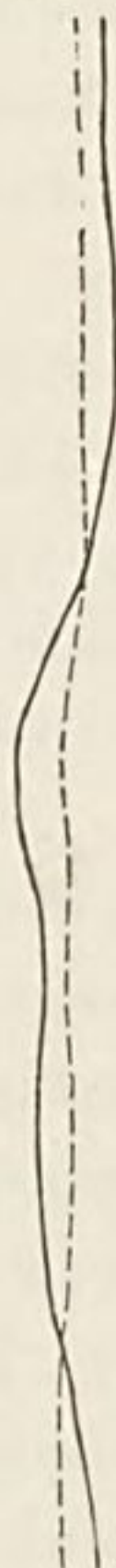
Parents healthy. Child healthy until August 15, 1872, when she was taken sick with scarlet fever, from which she made a good recovery. Some time during the following year she was thrown from a horse. Did not complain much at the time, but has since developed spinal disease.

Oct. 16, 1876, patient first seen, having spondylitis in dorsal region, with slight deformity. Unable even to sit up without supporting herself by her hands upon chair.

Suspended patient, and applied jacket, which gave her great comfort. October 23, 1876. Jacket divided in front, and secured in position with roller bandage. New jacket applied December 18, but was cut down on the second day on account of a twist in it, caused by unskilful handling in taking patient from suspension apparatus. This divided jacket was secured by a roller

bandage, and worn until Feb. 1, 1877, when a new jacket was applied, which was worn entire until February 17. It was then cut down and secured with roller bandage, as it was too tight. Three days ago, forgetting her spinal difficulties, she jumped down three steps, causing quite severe pain in the back. This

Case 49.



Spinal Curvature before and during Suspension.

was the first pain she had experienced since she came under treatment. Mother and patient both testify in favor of wearing jackets entire. March 21. New jacket applied. Is almost consolidated. June 7, 1877, plaster jacket applied, and made into a corset to be worn for protection. Consolidated in about eight months, with very slight deformity. Four jackets used.

Case 50. Edward M., 36 Columbia Street, New York, aged three and a half years.

Father healthy. Mother delicate, but not sick. Child well until two years of age, when he began to complain of pain in the epigastric region, and was treated for worms. After this, "lump" in back was noticed, and patient was taken to Forty-second Street hospital, where a spinal brace was applied in the summer of 1875, which he has since worn. Mother states that patient has gradually grown worse.

October 18, 1876, patient first seen, having spondylitis of middle dorsal vertebræ. Suspension relieves patient from pain, and lessens deformity.

Suspended patient and applied plaster jacket, which afforded patient entire comfort. November 8.

Case 50.



Spinal Curvature before and during Suspension.

Jacket divided in front, removed, and a fenestra cut over most prominent spine, as they had become galled. Jacket re-applied, and held in position by roller bandage. May 8, 1877. Boy can walk with comfort and curve has not increased. October 16. New jacket applied. Large swelling upon inside of right thigh; no fluctuation. May 10, 1878. Apparently nearly consolidated. Abscess increased in size. Aspiration has been attempted on two different occasions, but has not been successful. September 5, 1878. Boy has been in the country since last date. Getting along very nicely; good appetite, sleeps well. Nothing done to-day. January 17, 1879. Jacket, which was applied about five months ago, was cut down and secured with roller bandage. Child taken home for a bath. Within a month a fluctuating tumor has become very prominent on the upper and outer portion of right thigh, while the abscess

upon the inside of the thigh has materially diminished in size. About February 20, abscess upon outer portion of right thigh was opened with a free incision, and dressed with Peruvian balsam and oakum. Had a severe chill, was confined to his bed, and came near dying. Blood per rectum. Quinine. Improvement. New jacket with head-rest; still under treatment.

Case 51. Lewis Easton F., St. Louis, Missouri, aged nine years.

Parents healthy. Child well up to December 25, 1873, when, while playing in a hayloft, he fell headlong down a hole in the haymow to the barn floor, a distance of eight feet. He cried for an hour after the fall, saying his back hurt him. Was toler-

ably well for some two or three weeks, and then began to complain of pain in his shoulders. Was treated for rheumatism for some weeks, when it was found he had lateral curvature. Drs. Schoaley and Payne applied a spinal brace, which was worn fourteen months. It was now discovered that he had a double lateral and very prominent posterior curvature. Dr. Franklin, of St. Louis, applied a new apparatus, which gave very little relief. This was worn six months. Posterior deformity increased, and breast-bone became more prominent. About October 17, 1876, began to experience great difficulty in walking, and by October 21st became unable to walk at all.

Oct. 27, 1876, patient first seen, with spondylitis of dorso-cervical junction. Unable to walk, but can stand if supported. Convergent strabismus exists, but it has been of only a few weeks' duration.

Suspended patient, and applied plaster jacket. When "set," he could stand without further assistance. Slept better that night (father says) than in two years. It was noticed on the following day that patient still carried his head forward in a constrained position, had a peculiar catch in his respiration, and the convergent strabismus continued. By placing hands under chin and occiput, and lifting his head slightly, strabismus disappeared, but returned on withdrawing support. Jurymast ordered. November 8. Applied head-rest to old jacket at Bellevue Hospital before class. Strabismus disappeared, and respiration became normal (see Figs. 32 and 33). On following day he went to Philadelphia, and spent two days in walking around the Centennial Buildings. November 16 left for his home in St. Louis, but on his way met with an accident, which caused his death in twenty-four hours afterwards. He fell over backwards from the upper berth in a sleeping car, striking his head upon the floor, having lost his balance while kneeling to say his

Case 51.



Spinal Curvature before and during Suspension.

prayers, and died November 17, 1876, twenty-four hours after the injury.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 70.

Fig. 32.



Fig. 33.



Case 52. John Taylor, Indian Orchard, Massachusetts, aged three and a half years. (Sent by Dr. Smith, of Indian Orchard.)

Parents healthy. Father states that boy has always fallen down more or less. About the first of October, 1876, projection of spine was first noticed. Has had abdominal pains.

December 5, 1876, first seen, having spondylitis of dorso-lumbar junction. Suspension relieves deformity materially. Penis erect and very red. Unable to stand.

Suspended patient and applied plaster jacket. Boy could stand and was comfortable. May 17, 1878, learned that he had improved.

Case 53. Robert Lee R., San Francisco, California, aged five years.

Parents and two sisters remarkably healthy. Boy strong and healthy until two years of age. At this time he fell from a rocking-horse, afterwards complaining of pain over sternum. In a

few weeks protrusion of head was observed. A few weeks later Dr. Blake of San Francisco diagnosticated spinal disease and applied a brace with a head-rest. As this gave the patient no comfort, he was taken to Dr. Brigham, who placed him upon a level bed and applied a night cap with long tail pieces, which extended over the head of the bed and was filled with shot so as to make extension upon the upper portion of the spine. Afterwards taken to Indianapolis Institute; brace applied, which has been constantly worn for the past three years. Since June, 1876, has been obliged to maintain horizontal posture.

Came to me December 14, 1876, having spondylitis of upper dorsal vertebræ. Head drawn down between shoulders, but during suspension pulls out. Unable at times to walk.

Plaster jacket and head-rest applied during suspension, and worn entire until December 27, when it was cut down and secured in position by a roller bandage. February 6, 1877, new jacket and bandage applied. Walks without other support. February 21, old jacket divided in front and secured with bandage until March 1st, when a new jacket with head-rest was applied. About May 1st returned to California. Letter from Dr. H. L. Sims in the fall of 1877 reports continued improvement.

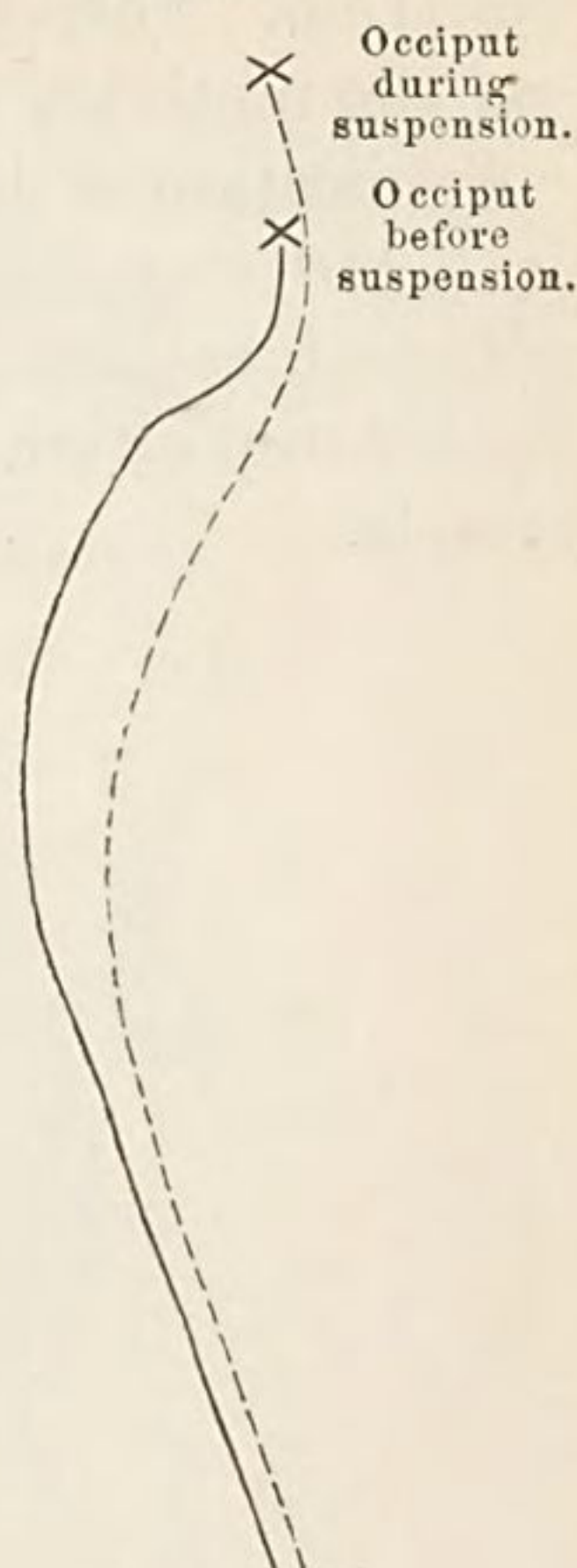
Remarks.—It is probable, had the treatment of Dr. Brigham been continued, the result would have been a good recovery.

Case 54. Frank D. H., West Stockbridge, Mass., aged fifteen years. (Sent by Dr. Levens.)

Father healthy; mother delicate. Only child. In July, 1874, fell from chair, striking upon edge of box. Pain in bowels and hips, which is exaggerated at night. Difficulty in urinating. In December, 1876, Dr. Levens detected Pott's disease, and sent him to me for treatment.

First came under treatment January 12, 1877, having spon-

Case 53.

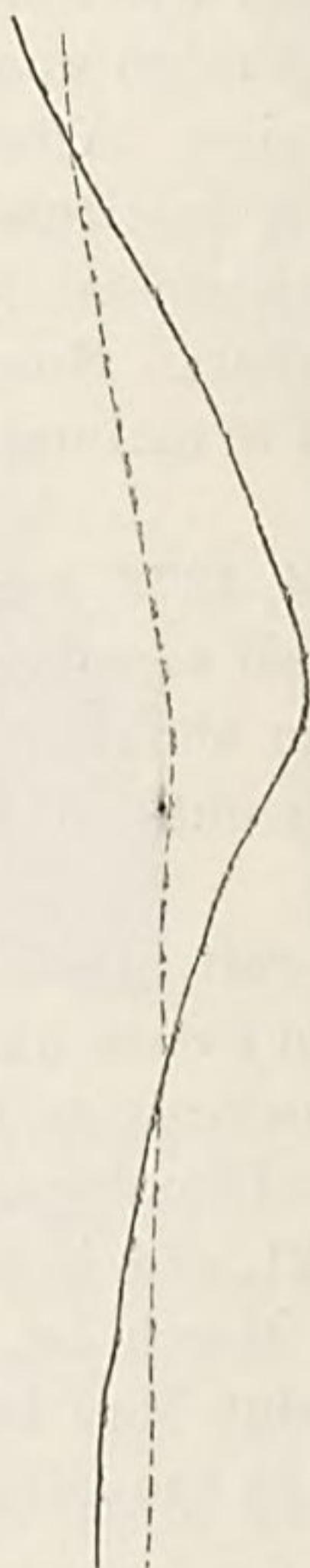


Spinal Curvature before and during Suspension.

dylitis of eighth, ninth, and tenth dorsal vertebræ, with sharp projection. Suspension almost obliterates deformity. Pressure over the ninth rib causes exquisite pain.

Application of jacket was effected during suspension of patient, but soon divided through to the skin on account of difficulty in breathing, due to his shirt fitting too tightly. Jacket secured in position by roller bandage, which made patient comfortable.

Case 54.



Spinal Curvature before and during Suspension.

Case 55. Levis B., Morrisville, N. J., aged two and one-half years.

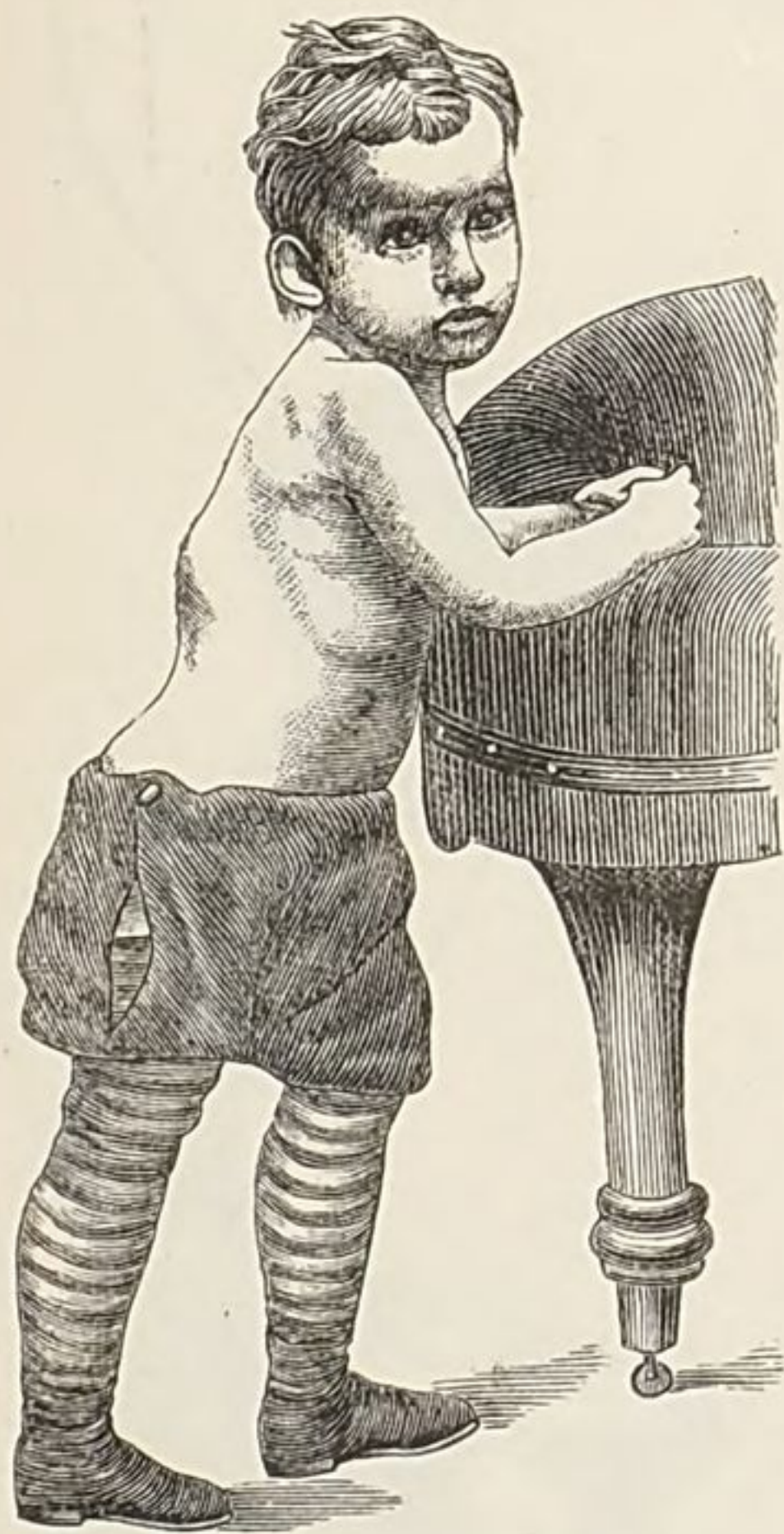
Child had "ague" when four weeks old. Walked when a year old. Was very active. About January, 1876, first noticed child leaning to one side. There have been times when, for several days, he has been unable to walk. No known cause of trouble. About June, 1876, a posterior curvature was noticed.

June 19, 1877, patient first seen, having spondylitis of eighth, ninth, tenth, and eleventh dorsal vertebræ. Suspension reduces

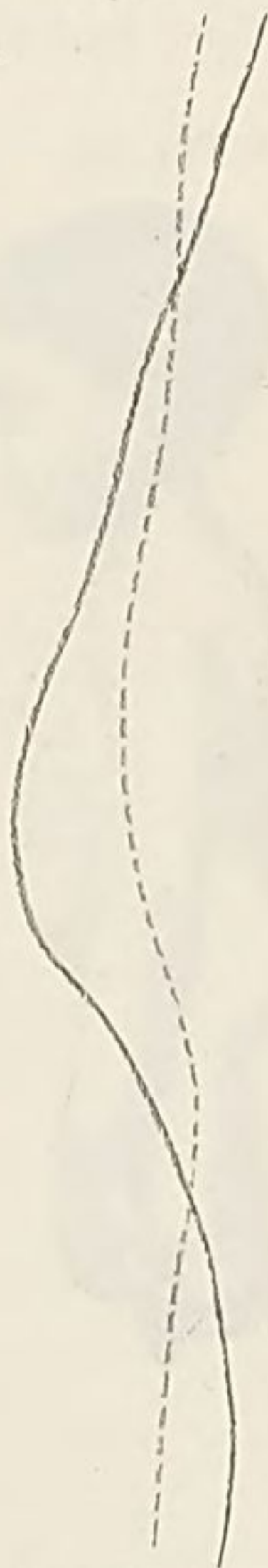
deformity. Unable to stand without support. Position as seen in Fig. 34.

Plaster jacket applied during suspension, and while plaster was setting, child went to sleep. Rosy cheeks for the first time in six months. Letter March 25, 1879, states that "curvature has in a large measure disappeared, and health improved." After

Fig. 34.



Case 55.

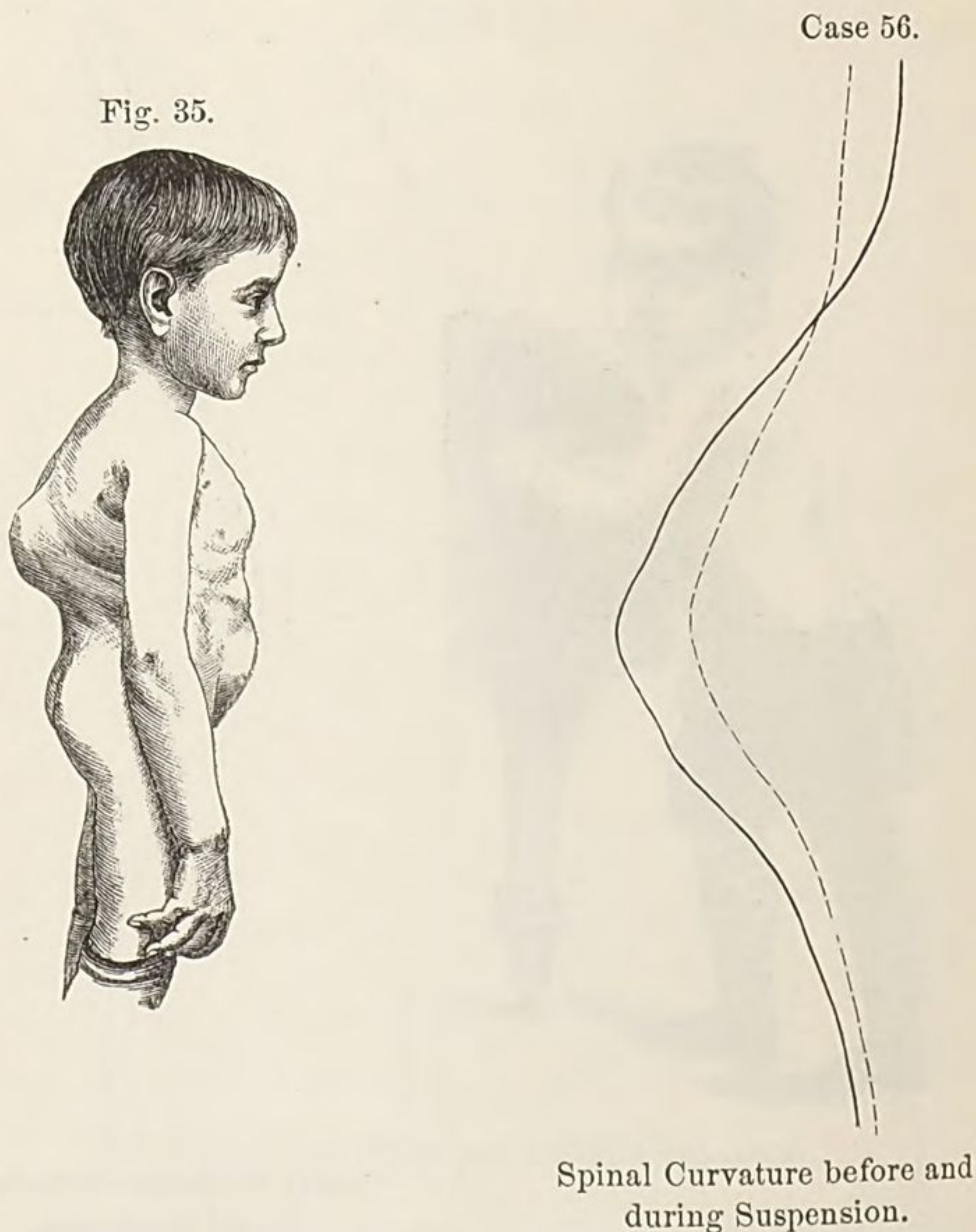


Spinal Curvature before and
during Suspension.

first jacket ceased to give proper support, patient was taken to Norwich, New York, but the physician consulted thought jacket would last a while longer. Soon after an abscess in the groin made its appearance, opened, and has discharged ever since. Finally, the jacket having become thoroughly worn out, the child became very much worse. Contraction of muscles rendered walking impossible. Rubbing relieved contraction somewhat. More abscesses appeared and opened, but soon healed.

At present patient eats well, though he is apparently quite anæmic. Walks and runs about the house. Partial ankylosis, and great improvement in the compensating curves.

Case 56. Sidney B. H., Irvington, New York, aged nine years. Disease of spine first noticed in 1871. No known cause. In 1872 an abscess formed upon back. Since then two others have formed, which are still discharging. Has worn various braces.



Jan. 20, 1877, patient first seen, having spondylitis of middle dorsal. Nearly all of the dorsal vertebræ involved in the deformity, which is very great. Position as seen in Fig. 35.

Suspended patient and applied plaster jacket, cutting fenestra over abscesses. This afforded patient entire relief. Left for home. I was informed a month later by Mrs. Cyrus Field that child died of pneumonia within a month after application of first jacket.

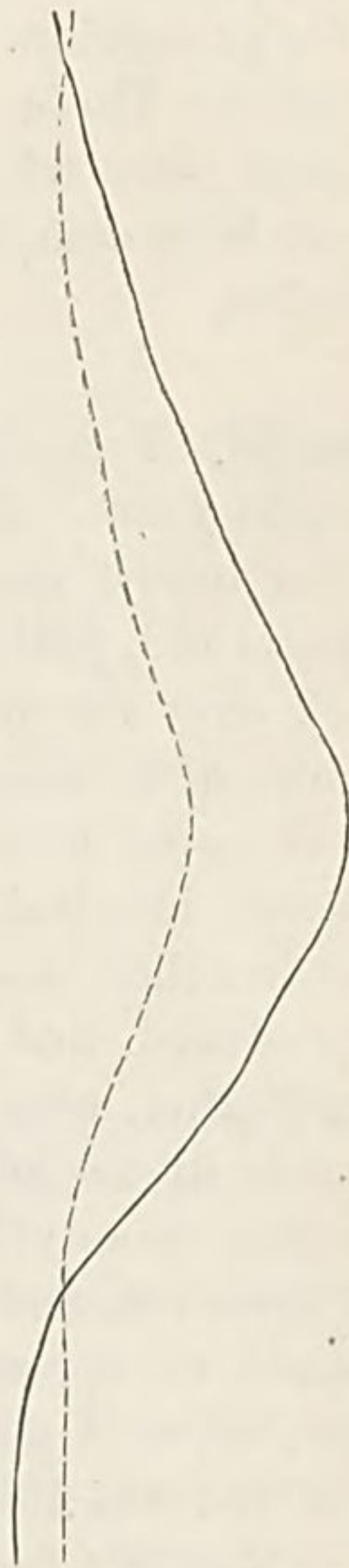
Remarks.—It is probable that child might have taken cold during the application of the jacket, as it was a very cold day, and he was taken out into the cold immediately after its application. No post-mortem was obtained.

Case 57. Lizzie P., Gates Avenue, Brooklyn, aged thirteen years.

When four and a half years of age fell from a high chair, striking upon genitals. Three weeks later had pain in left leg.

Case 57.

Fig. 36.



Spinal Curvature before and during Suspension.

Was thought to have hip disease; got better, but did not regain full use of the limb. When six and a half years of age, had scarlet fever, at which time began to complain of pain in back and left side. Some months after noticed slight curve of spine.

Then taken to Forty-second Street Hospital, where spinal brace was applied and worn up to date. Has gradually grown worse.

Jan. 24, 1877, patient first seen, having spondylitis of eighth, ninth, tenth, and eleventh dorsal vertebræ. Deformity greatly diminished by suspension. Extremely emaciated. Weight sixty-four pounds with heavy winter clothes on. Position as seen in Fig. 36.

Jacket applied at Bellevue Hospital during suspension. Feb. 20. Much improved. March 17. Continued improvement. April 13. Firmly consolidated, with quite marked deformity, having been under treatment less than three months. New jacket applied for protection.

Remarks.—There is no doubt but that partial consolidation had taken place when the jacket was first applied, but it could not have been complete, as there was so much improvement by suspension.

Case 58. Francis J. T., 215 West Twelfth Street, New York, aged eight years. (Sent by Dr. R. P. Lincoln.)

Father robust man, died of congestion of the brain. When four years old, patient fell backwards, striking upon the small of back over the fender of a fireplace. Several months later fell again, after which had a great deal of pain. Slight "fulness" of spine noticed in May, 1873. Patient was taken to 42d Street hospital, where brace was applied and worn until patient reached home, when it was removed on account of pain produced, and never reapplied. Two weeks later taken to Dr. Shaffer, who applied a Taylor's brace, which was worn constantly up to October 17, 1876, when patient was brought to me having spondylitis of ninth, tenth, eleventh, and twelfth dorsal vertebræ, and an abscess discharging into rectum, which first made its appearance, according to mother's statement, in October, 1874. Upon ascertaining patient was under the treatment of Dr. Shaffer, I refused to do anything without his presence. Nothing further was seen of patient until January 31, 1877, during which time patient had been wearing his steel brace. I now removed the brace, and as skin was inflamed over projecting vertebræ, child was sent home to be washed and kept in bed until skin was in good condition.

Spondylitis involved eighth, ninth, tenth, eleventh, and twelfth dorsal vertebræ. Unable to stand without resting hands upon a support, as seen in Fig. 37. Suspension relieves deformity

somewhat. Compression upon head or shoulders causes intense pain. Extension gives perfect relief. Abscess still discharging through rectum.

February 8, 1877, patient suspended with adjusted shirt and dinner-pad, and a plaster-of-Paris jacket applied in presence of Prof. C. A. Budd, Drs. Formento, Taylor, Chambers, and Car-

Fig. 37.

Case 58.



Spinal Curvature before and
during Suspension.

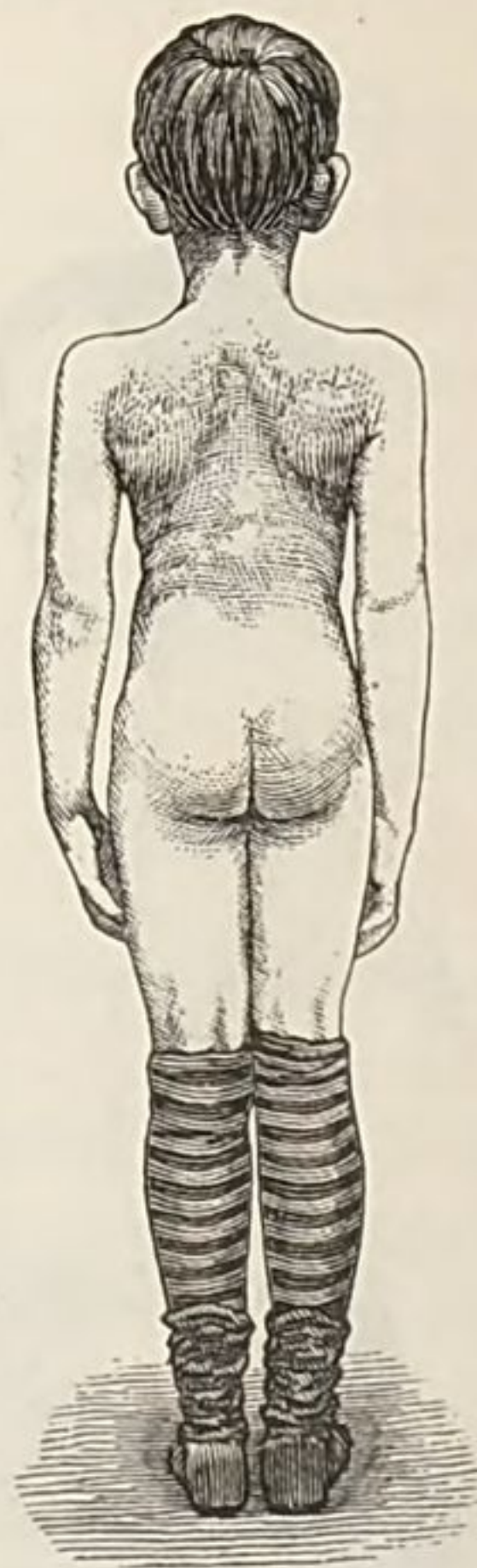
penter. A pad was placed on each side of vertebral prominence. When dressing had become hardened, child could stand and walk without other support. February 10. Too much dinner-pad was used on the 8th; divided jacket in front, removed an inch, and secured in position by roller bandage. February 26. New jacket, constant improvement. Muscles on either side of prominence developing since removal of pressure of brace. April 14. Patient's general condition much improved, as shown in Fig. 38. During summer of 1877 patient sustained two severe falls, and a new jacket was applied by Dr. Robert Taylor. Jan., 1878, had a new jacket applied; was also circumcised. Feb.

23, jacket cut down and secured by roller bandage, so it can be removed and child washed. April 22, patient exhibited before New York County Medical Society. July 16, new jacket; patient better than he has been for five years. Feb. 15, 1879, jacket

Fig. 38.



Fig. 39.



applied at last date, removed, and a new one applied. April 25, splendid condition, child is rosy, and stands erect. Consolidated, having been under treatment two years and three months. Slight deformity, as shown by photograph taken by O'Neil April 25, 1879. (See Fig. 39.) Stands perfectly erect. No lateral curve.

Case 59. Cornelius F. B., 10 Van Ness Place, New York, aged five years.

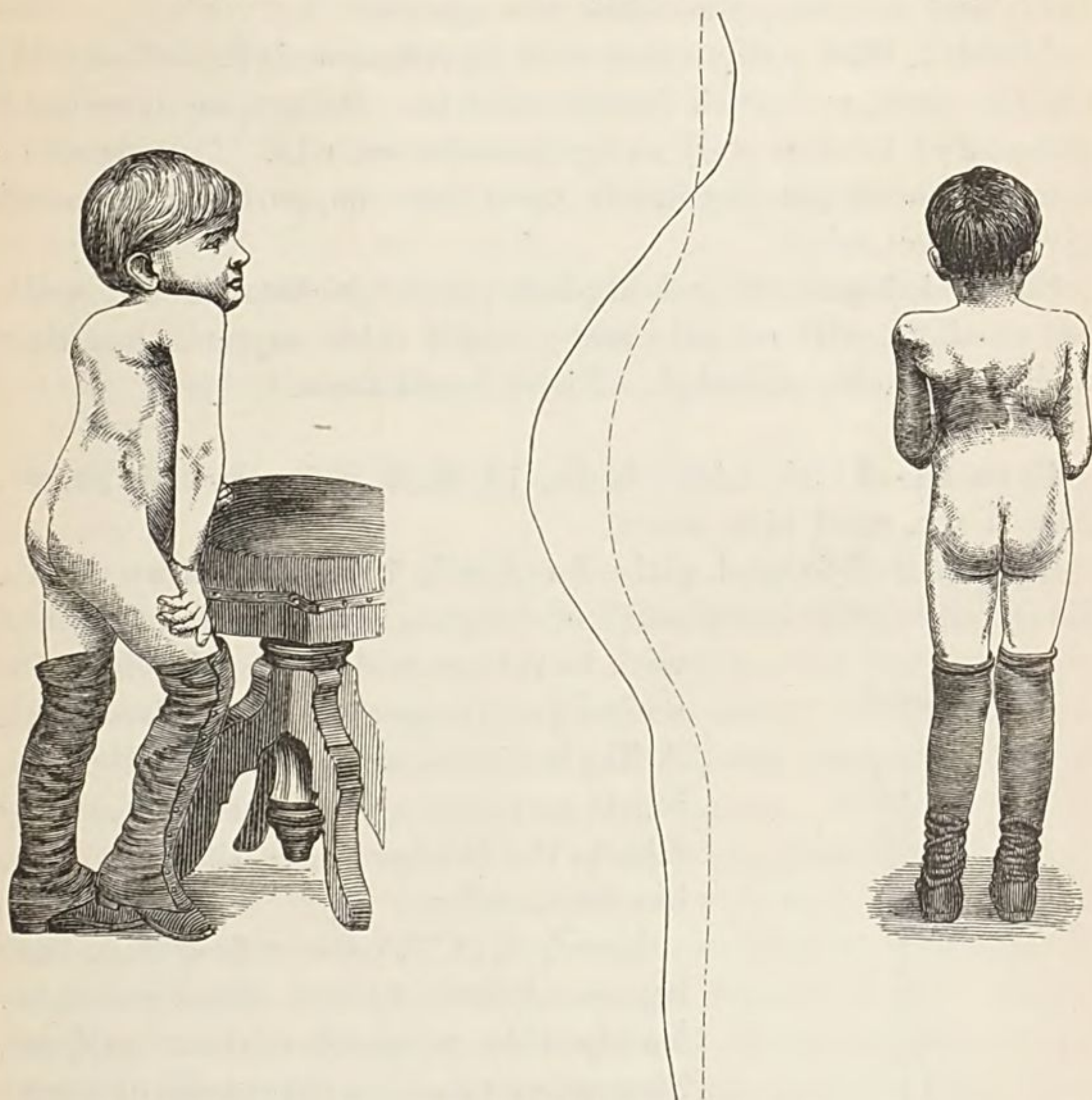
Mother very healthy, father moderately so. In 1874 had diphtheria, and was very weak for six months thereafter. A swelling on left elbow was then noticed, which went on to suppuration, and finally some pieces of bone exfoliated. About the same time knuckle appeared in back. He was then taken to Dr. Knight, who applied a brace, which has been worn ever since.

February 24, 1877, patient first seen, having spondylitis of fourth, fifth, and sixth dorsal vertebræ. Unable to stand without support. Shoulders elevated. Position as seen in Fig. 40.

Fig. 40.

Case 59.

Fig. 41.



Spinal Curvature before and
during Suspension.

Suspended patient, and applied plaster jacket. Will probably require head-rest. March 5. New jacket with head-rest applied, which made patient perfectly comfortable. A new jacket was applied every six weeks or two months by the mother and her family physician Dr. Webster, and in July, 1878, he was perfectly consolidated, with diminished deformity, as seen in Fig. 41, having been under treatment seventeen months.

Case 60. Kate S., New Britain, Connecticut, aged five and a half years.

Parents and five other children remarkably healthy. Patient

healthy. In April, 1876, she complained of pain in abdomen, which was not relieved by treatment. In September, 1876, had a severe fall, striking upon back upon edge of step. She rapidly grew worse, losing strength and appetite. About February 10, 1877, first noticed prominence of vertebræ.

March 2, 1877, patient first seen, having spondylitis of seventh, eighth, ninth, and tenth dorsal vertebræ. Pain upon downward pressure of head as well as by pressure on ribs. Cannot sit or stand without placing hands upon some support. Suspension gives perfect relief.

Suspended patient and applied plaster jacket. Could walk or run about without pain and without other support than that which the jacket afforded. Never heard from.

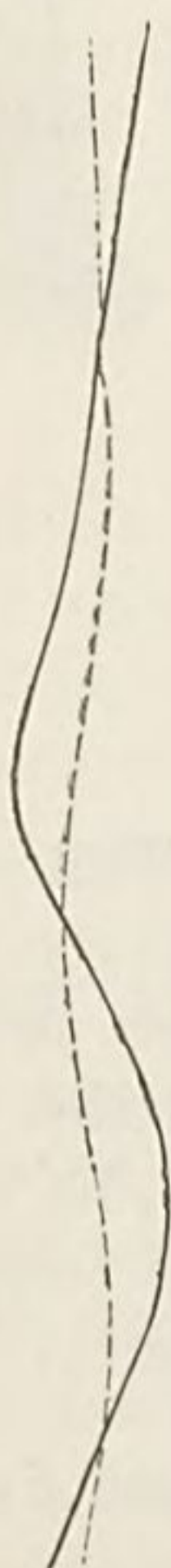
Case 61. Lizzie Affleck B., 19 East Fifty-seventh Street, New York, aged nine years.

Strong, well-formed girl. In April, 1875, fell down stairs. Six months after complained of fatigue, lassitude, and did not wish to ride or walk. In March, 1876, undue prominence of spine discovered. A Taylor brace was applied by Dr. Hel-muth, and worn a year, notwithstanding which, the mother states the curvature has increased.

March 9, 1877, patient first seen, having spondylitis of lower dorsal vertebræ. Barely able to stand without support. Suspension produces improvement in the spinal curve.

Suspended patient and applied plaster jacket. March 10, says she slept better than for six months, and much prefers the jacket to the steel brace. April 24. New jacket. Improvement great. Can jump upon heels with knees rigid without pain. March 17, 1878. Jacket has been newly applied from time to time according to increase in size of patient. Consolidated with some deformity, having been under treatment about twelve and a half months, and worn seven or eight jackets. New jacket for protection.

Case 61.



Spinal Curvature before and during Suspension.

Case 62. Southern H., 345 Kent Avenue, Brooklyn, aged four years. (Sent by Dr. Mattison.)

Parents and two brothers healthy. In October, 1876, had typhoid pneumonia, which was shortly after falling from a swing. After fall abdomen swelled. Knuckle in back was noticed, which gradually grew larger. Has been unable to stand without support since November, 1876.

March 15, 1877, patient first seen, having spondylitis of fourth, fifth, and sixth dorsal vertebræ. Deformity nearly obliterated by suspension. Unable to walk.

Applied skin-fitting knit shirt, suspended patient, and then applied plaster jacket. When "set," he could walk, and his grunting respirations had entirely disappeared.

Case 63. Wm. B. E., Jr., Yonkers, aged six years and four months.

Parents and two other children healthy. In 1873 had whooping-cough, followed by pneumonia, from which he made a good recovery. Slipped while on the ice, causing great pain and partial paralysis of left leg. Dr. Foster Jenkins considered the paralysis a sequel of diphtheria. Dr. Pooley suspected Pott's disease, and sent the patient to Dr. Taylor. A diagnosis of Pott's disease was made by Dr. Taylor, when prominence of vertebræ was scarcely perceptible. Child was then taken to Dr. Parker, who advised Marsh's spinal brace, which was applied and worn. Dr. Pooley opened a large abscess in left thigh, which is still discharging. Five small pieces of bone have escaped. Has worn a Taylor or Marsh brace constantly. Disease has progressed.

March 21, 1877, patient first seen, having spondylitis of upper dorsal vertebræ. Unable to stand without support. Position almost identical with that of Cornelius F. B. See Case 59, Fig. 40.

Back was sore from pressure of brace pads when I first saw the patient, and for past two weeks patient has been kept in bed. Back is healed, but skin is still red. To-day suspended patient and applied plaster jacket with head-rest. In a half-hour afterwards he got up and walked without other support, and with full and free respiration. Had not felt so well in two years. April 13. Much improved. New jacket. Aug. 1. New jacket applied by Dr. Bryant, and again, on Sept. 28, he applied another. Dec. 28. New jacket. Skin in perfect condition. March 19, 1878. Has had measles. Jacket was not removed

until to-day, when skin was found in good condition. New jacket with head-rest applied. Child could stand alone for a short time without any support whatever. June, 1878. Nearly consolidated. New jacket applied and made into a corset. Oct. 22. Progressing favorably. Has had frequent baths, country air, etc. New jacket with head-rest.

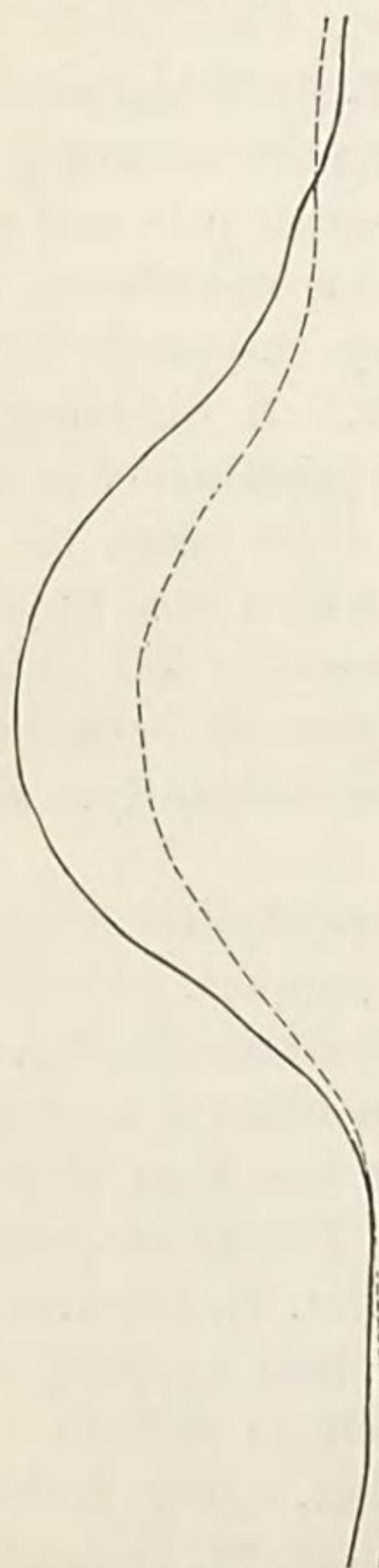
Consolidated two years and four months. Seven jackets used.

Remarks.—June 3, 1879. Returned to-day with back consolidated; but, unfortunately, he now has hip disease on the right side, in the first stage, from a fall sustained in April.

Case 64. T. F. O., Bedford, Indiana, aged eighteen years.

Father healthy; mother died of phthisis; brother healthy.

Case 64.



Spinal Curvature before and during Suspension.

When three and a half years old the nurse was lifting him up and down by the arms, and let him fall accidentally on the floor, injuring his back so he could not walk. After a while he began to walk with hands upon thighs. He was examined by a number of physicians, but no one could tell what was the matter until the lump began to appear, when spinal disease was diagnosticated. He was kept on his back one year, and then a brace was applied which was obtained in Cincinnati, but he could not wear it on account of pain and difficulty in breathing. Eight or nine years passed without treatment, during which time he required the support of his hands upon thighs when standing or walking. Went to Indianapolis Institute in 1873, pretty much in the same condition as when he came to me, "except that his hump is now a little more prominent." A brace was applied which has been worn ever since, and for the last two years uninterruptedly, day and night.

March 22, 1877. Spondylitis of middle dorsal vertebræ. Unable to stand without support. Says he feels more comfortable without instrument than with it.

Suspended by the head and axillæ, and a plaster jacket applied. Two hours afterward he walked, without cane or crutch, to his hotel, and left for his home the same evening. Height increased a little over an inch, and he was free from pain. April 25. In a letter states that he has entered college, and can do a full day's work with other students; also, can walk two or three miles without fatigue. April 2, 1879. Patient called at office. Treatment after March, 1877, had been by Dr. J. O. Stillson, of Bedford, Ind. Has had in all four jackets. Quit treatment in January, 1878, consolidation having taken place in about nine months, with little improvement in deformity.

Remarks.—*Vide* published history, "Sayre on Spinal Disease and Spinal Curvature," p. 73.

Case 65. Ottokar S., 83 South Sixth Street, Williamsburgh Station, Kings County, New York, aged eight years.

Parents and their two other children healthy. Child was never robust, but was always active. In the fall of 1876 he was thrown from another boy's back, and on the following day sustained a fall from a velocipede, striking with his back against the fence. For a time he was unable to get up, and complained of pain in the epigastrium. Dr. Blannerhasset, according to mother's statement, treated patient for peritonitis. Afterwards Dr. Alcott detected "weakness of the spinal column," and proposed a supporter.

March 29, 1877, patient came under treatment, having spondylitis of eighth and ninth dorsal vertebræ, with sharp angular projection. Intense pain caused by pressure over eighth and ninth ribs. Extension across my knees, and pressure upon projecting spine relieved pain.

Jacket applied at Bellevue Hospital before the class, during suspension of patient. This was worn two weeks. Feb. 1, 1878. Five jackets have been

Case 65.

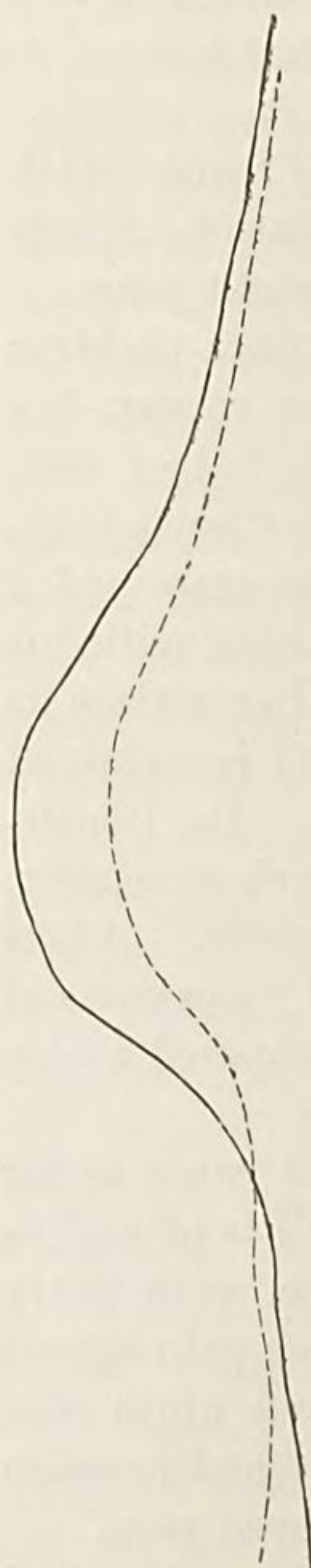


Spinal Curvature before and during Suspension.

applied since last date. Is very much improved. New jacket will be applied at hospital in a few days. April 12. Consolidated, with slight deformity. New jacket for protection, and made into corset. August 27. Still wearing plaster corset. Remains well, consolidation having taken place in about twelve and a half months. Seven jackets used.

Case 66. Frank B. G., Roseville, N. J., aged eleven years. Parents and two other children healthy. In 1874 boy in-

Case 66.



Spinal Curvature before and during Suspension.

jured his back from jumping from a height of twelve feet. Complained of stomach-ache. Troubled with "dyspepsia." Six

months after injury lump in back was noticed, and painted with iodine. In May, 1876, Dr. Shaffer applied a brace, which has been worn ever since; notwithstanding which, the mother states that the deformity continued to increase. In December, 1876, he lost the use of his right leg.

April 4, 1877, patient first seen, having spondylitis of seventh, eighth, ninth, and tenth dorsal vertebræ. Kyphotic curve very prominent. Skin chafed where brace pads have pressed.

Suspended patient and applied plaster jacket with the assistance of Dr. J. S. Green, of Elizabeth, N. J., and Dr. W. M. Carpenter, of New York. Great relief afforded patient. He was able to walk, and better color was noticed in his face. May 9, new jacket applied in the presence of Drs. McClary and Harney. Greatly improved. Nov. 23, has had one new jacket since last date. Continued improvement. Has phimosis. Frequent and prolonged erections. Applied new jacket, but divided in front as soon as hardened, because shirt was too small. Jacket secured with bandage. Patient circumcised. March 18, 1878. Excoriation over prominent spine, owing to ill support of divided jacket. New jacket applied. June, 1878. New jacket applied and made into corset, but it did not give as good support after cutting. November 19. New jacket applied, to be worn entire. January 19, 1879. Constant improvement. New jacket applied. March 25, 1879. Does not complain in the least. Plays all day out of doors.

Case 67. Maggie C., 150 Leonard Street, New York, aged three and a half years. (Sent by Dr. Sproat.)

Parents and eleven other children healthy and strong. December 25, 1875, patient fell down twelve or fifteen steps, cried considerably, but soon recovered herself, with the exception of cramps in feet and legs. Taken to Dr. Taylor, who diagnosed Pott's disease of last dorsal and first lumbar vertebræ. A brace was applied and worn for two months, but cramp continued.

April 13, 1877, patient first seen, having spondylitis of dorso-lumbar junction. Suspension gave immediate relief from pain and cramp in legs.

Suspended patient and applied plaster jacket, which afforded her great relief. April 28, 1879. Child was brought to office to-day. Has been at the Outdoor Department of Bellevue Hos-

pital, where jackets have been applied as occasion demanded. Seven or eight months ago an abscess made its appearance in the right groin. Three months ago jacket was removed and abscess opened spontaneously and discharged for about two months. When jacket was removed patient was consolidated, and there is now no evidence whatever of tenderness about the formerly diseased vertebræ. Has had in all about eight jackets.

Under treatment one year and nine months. Consolidated. About eight jackets used.

Case 68. Arthur N., 67 West Fifty-fifth Street, New York, aged six and a half years.

Family history good. When patient was nine months old fell from nurse's arms. A year later projection of upper dorsal spine was noticed. July 29, 1873, he fell down some stone steps and

Case 68.



Spinal Curvature before and during Suspension.

struck his left knee. Sept. 15, Taylor's knee-brace was applied. Dec. 26, 1873, Taylor's spinal brace was applied. Knee was twice aspirated by Dr. Taylor, and then freely opened with the knife. The child was first brought to me in June, 1874, to be treated for knee-joint disease. I applied my knee-extension splint, re-adjusted Taylor's spinal brace, opened abscess upon outer and upper portion of knee-joint, after which patient's mother took sole charge of him until April, 1877, when he was brought to me to be treated for spinal disease, as the deformity was gradually becoming more marked, and he was a great sufferer. Taylor's spinal brace has been worn night and day since its first application in December, 1873.

Patient had spondylitis affecting the upper dorsal vertebræ. Child unable to stand without placing his hands upon thighs. Respiration short, labored, and painful. Knee-joint disease is progressing favorably, and the motion, when the instrument is off, is good.

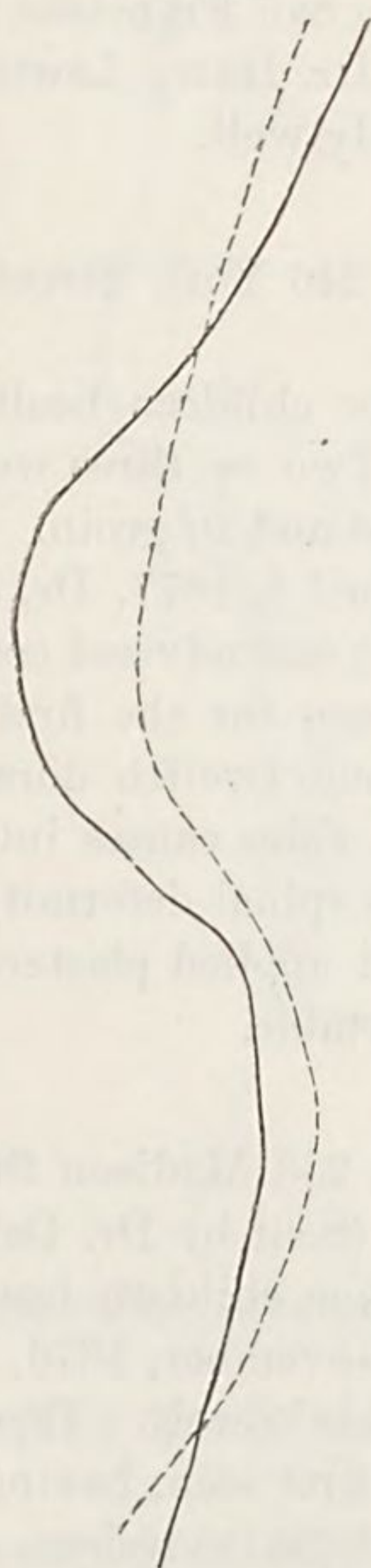
April, 1877. Patient was suspended with adjusted shirt and dinner-pad, and a plaster jacket with head-rest applied. Patient felt great relief, his respiration became quite normal, and his

position was much improved. First jacket was worn two months, and then a new one was applied. August 7, 1878. General health much improved. Patient gaining in activity all the time. New jacket applied to-day, which is the seventh he has had. Nov. 15. New jacket and new head-rest applied, the old head-rest having become too short on account of increased height of patient.¹

Under treatment about twenty-seven months. Consolidated in improved position. Eight jackets used.

Case 69. W. A. S., San Francisco, Cal., aged eight years.

Case 69.



Spinal Curvature before and during Suspension.

¹ June 28, 1879. Patient returned. Jacket removed and spine found thoroughly consolidated, and undoubtedly has been for some months. Knee is cured, with almost perfect motion. Health good; cheeks rosy.

Parents and one other child very healthy. When fourteen months old it was noticed that he leaned his head to one side, and that he did not sit up straight. Dr. Douglas, of San Francisco, detected slight curves of the spine in middle dorsal region. Taylor brace applied, but deformity increased. Brace was removed, and no mechanical treatment has since been used, nourishing diet and outdoor exercise being the only means adopted to improve the child's condition.

April, 1877, patient first seen, having spondylitis of middle dorsal region.

Was suspended, and plaster jacket with juremast applied. Deformity decreased, and patient able to take more exercise.

Remarks.—Returned to San Francisco, and has jacket applied, as occasion requires, by Dr. Harry Lewis, who writes January, 1879, that he is apparently well.

Case 70. Ann McN., 246 York Street, Brooklyn, aged three and three-quarter years.

Parents and four other children healthy. About January, 1877, fell down stairs. Two or three weeks after, patient complained of pain over hips and in groin. Was thought to have rheumatism. About April 1, 1877, Dr. Johnson, of Brooklyn, detected lateral curvature, and advised cod-liver oil and exercise.

May 8, 1877, patient seen for the first time, having spondylitis of tenth, eleventh, and twelfth dorsal vertebræ. Pressure over shoulders and upon sides causes intense pain. Extension relieves pain and reduces spinal deformity.

Suspended patient, and applied plaster-of-Paris jacket, which made her entirely comfortable.

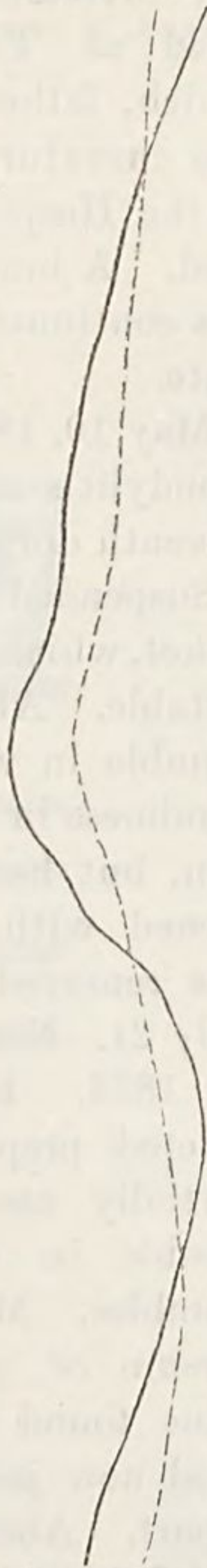
Case 71. Thomas H., 258 Madison Street, New York, aged five and one-half years. (Sent by Dr. Detmold.)

Parents and seven other children healthy. Patient always delicate. Since about November, 1876, has been "stiff in his walk," and had pain in his bowels. Treated for worms.

May 10, 1877, patient first seen, having spondylitis affecting fifth, sixth, and seventh dorsal vertebræ. Unable to stand without support. Has phimosis. Suspension relieves pain and decreases deformity.

Suspended patient, and applied plaster jacket after. Able to walk without other support.

Case 71.



Spinal Curvature before and during Suspension.

Case 72. Robert J., 184 Grand Street, Brooklyn, aged ten years.

Parents healthy. Patient is an only child. When four years of age, had small-pox, followed by pneumonia. Did not walk or talk for three weeks, seemingly from exhaustion. He recovered and was healthy until October, 1874, when he was thrown down and struck upon his back. Red spot noticed over about the sixth

dorsal vertebræ. Treated for worms for six months, when cur-

Case 72.



Spinal Curvature before and during Suspension.

vature became quite prominent, and a diagnosis of Pott's disease was made by Dr. Metcalfe, of Brooklyn. Brace applied at Tiemann's instrument-store, which, father says, seemed to decrease the curvature. In October, 1876, went to the Hospital for Ruptured and Crippled. A brace was applied, but patient has continued to grow worse, as parents state.

May 10, 1877, patient first seen, with spondylitis of eight, ninth, tenth, and eleventh dorsal vertebræ.

Suspended patient and applied plaster jacket, which made him thoroughly comfortable. About June 6th he began to stumble in walking, and complained of numbness in legs, difficulty in co-ordination, but had no pain. June 21. Returned with jacket badly broken; it was removed, and a new one applied. July 21. New jacket applied. January 25, 1878. Examination revealed constricted prepuce, which is thought to partially account for paralysis. Has trouble in urinating, and frequently stumbles. Made incision of prepuce on dorsum of penis, and uncovering the glans found hardened smegma. Applied new jacket, after which he could sit up without other support. About June 8th a new jacket was applied, and worn until July 22d, when it was removed and replaced by a new one. Patient stronger in his legs. October 28. New jacket, can bear entire weight upon legs. March 10, 1879. New jacket. Can put one foot before the other, and walk with crutches.

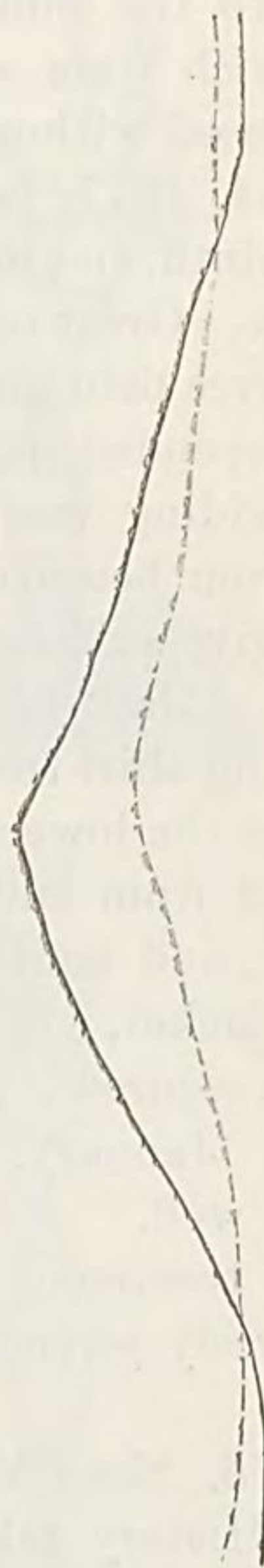
Case 73. Cornelius M., 316 East Thirty-sixth Street, New York, aged five years.

Mother and several other children healthy. Father has "rheu-

matism." About May, 1875, fell down stairs, and a month later he began to fall down whenever he laughed or cried, and a small knuckle appeared upon his back. Taken to Prof. Post's clinic, who diagnosticated Pott's disease, and sent him to Forty-second Street Hospital. Brace was applied, but deformity stead-

Case 73.

Fig. 42.



Spinal Curvature before and during Suspension.

ily increased, notwithstanding the constant wearing of the instrument. In Dec. 1876, contraction of muscles in right lower extremity began to take place, and now (May 11, 1877) the thigh is at right angles to trunk.

May 11, 1877, patient first seen, with spondylitis involving the sixth and seventh dorsal vertebræ. Kyphotic curve very sharp, as shown in Fig. 42, from a photograph.

Suspended patient and applied plaster jacket. This afforded him great relief, and he was able to stand without other support.

Case 74. Addie A., Morgantown, N. C., aged twenty-two years. (Sent by Dr. Whitehead, of Salisbury, N. C.)

Parents, sisters, and brothers healthy. When a young girl had lateral curvature. By use of braces was thought to be cured. In the summer of 1876 she was thrown from a wagon, since which time she has complained of her back. Actual cautery used without benefit.

May 14, 1877, patient first seen, with spondylitis affecting eighth, ninth, and tenth dorsal vertebræ. Slight antero-posterior curvature. Great tenderness over projecting spine. Self-suspension relieves pain and tenderness of spine entirely.

Self-suspended patient, and applied plaster jacket, but too much wadding was placed over abdomen, and when it was removed from beneath the jacket, the latter was so loose that it did not give sufficient support, although pain in back was much relieved. May 16. New jacket applied, putting pads under skin-fitting shirt from the top over breasts and epigastrium, and none over the lower part of abdomen. This jacket afforded perfect relief from suffering; she could walk and stand without difficulty, and could jump upon heels without pain. June 6. Divided jacket, which was a little too tight, in front, gapped it, and then secured it in position with a plaster bandage. No pain in back. January, 1878. Returned consolidated. May, 1878. Remains well.

Under treatment seven and one-half months. Consolidated with scarcely perceptible deformity.

Case 75. Mary M., 325 Avenue A, New York, about eight years. (History taken from the records of Second Surgical Division of Bellevue Hospital.)

Mother died of phthisis. Admitted April 16, 1877. Well-marked deformity in upper dorsal region. Both thighs flexed and fixed at an angle of forty degrees. (See Fig. 43*a*, from photograph.) A fairly nourished child. April 19. Child placed in bed, with pillows on each side of projecting spine. Feet elevated until spine was as nearly horizontal as possible. Extension of about four pounds' weight applied to each foot. This is to be gradually lowered until legs are as straight as possible. May

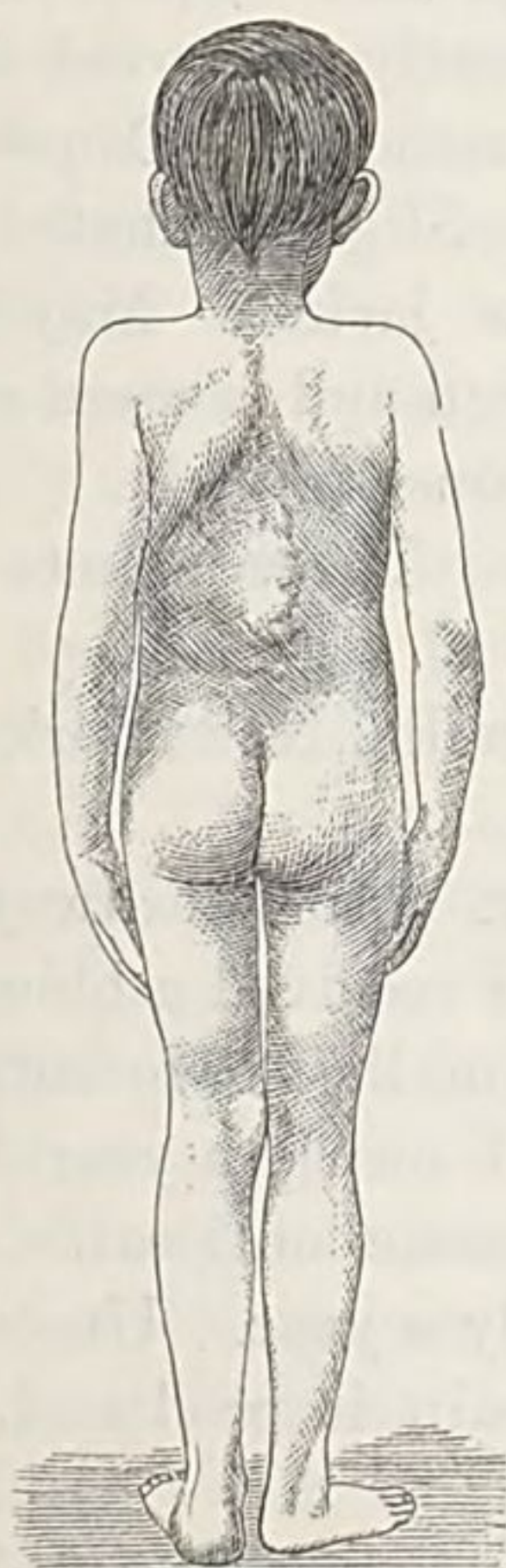
Fig. 43a.



Fig. 43b.



Fig. 43c.



Condition May 1, 1879.

Fig. 43d.



Condition May 15, 1879.

20. Legs nearly in natural position. Patient yet in bed with applied extension-weights. Small, deeply fluctuating spot in each groin, undoubtedly psoas abscess.

May 25, 1877. Plaster jacket applied, patient being suspended. May 26. Walks about the ward without other support than the jacket, and without pain. Her body inclines forward and to the left. (See Fig. 43*b*, from photograph taken July 11, 1877.)

April, 1879. Has had jackets applied as occasion required. Is now perfectly consolidated. Position greatly improved, as seen in Figs. 43, *c*, and *d*, from photographs.

Remarks.—This patient was sent to me for admission to Bellevue Hospital by Dr. V. P. Gibney, who suggested myotomy for relief of flexion of thighs.

Case 76. Amelia W., 23 Houston Street, New York, aged twelve years.

Disease first noticed in May or June, 1877.

September 7, 1877, patient first seen, having spondylitis affecting eighth, ninth, and tenth dorsal vertebræ; also lateral curvature.

Patient suspended, and plaster jacket applied by Dr. Joseph Bryant, which gave relief from pain, and improved position. November 5. New jacket, patient greatly improved in general health. January 5, 1878. Old jacket removed. Can stand quite erect without any support whatever. Slightly chafed skin over ninth dorsal vertebra. Applied new jacket. May 10, apparently consolidated, but jacket cut down and secured with roller bandage as protection. July, 1878, consolidated.

Under treatment about ten months. Three jackets used.

Case 77. Miles F. S., Washingtonville, New York, aged six years.

Parents and other children healthy. Patient always healthy until about September, 1874, when he received a blow upon the back of his neck from a carpenter's mallet. He suffered pain in lower part of spine. Was treated nearly a year for "some spinal trouble," when deformity became noticeable. Wore a spinal brace two hours a day for nearly a year. Unable to wear it more than this on account of the pain it produced. The deformity has steadily increased.

September 18, 1877, patient first seen, having spondylitis affect-

ing fifth, sixth, and seventh cervical vertebræ. Kyphotic curve very marked. Great tenderness over affected vertebræ. Suspension relieved pain.

Patient was suspended, and a plaster jacket with head-rest applied by Dr. Bryant with entire relief to patient. January 17, 1878. Been perfectly comfortable since last date. Gained in strength and flesh. New jacket with jnymast applied. Found skin normal. While jacket was off and patient lying quietly on sofa, he complained of pain in his head, and coughed constantly, both ceasing when extension was made upon head, and when new jacket with head-rest was applied and adjusted, he was comfortable, and coughing ceased.

Case 78. Jessie R., Hot Springs, Ark., aged three years and two months. (Sent by Drs. Basset and Jelks, of Hot Springs, Ark.)

Parents healthy. One child died of cholera infantum. Patient very healthy until about April 1, 1877, when a certain carefulness in her walk and stiffness in the carriage of her head were noticed. It was subsequently learned that, some time previous to these symptoms, child had fallen over backwards into a cracker-box, and hurt herself quite badly. She became less disposed to walk, and in the early part of August of the same year she began to have a croupy respiration. Treated for rheumatism, etc. Dr. Basset, of Hot Springs, Ark., diagnosticated Pott's disease, and applied a plaster jacket without head-rest. As disease was in cervical region, of course no relief was afforded. Two other jackets were subsequently applied by him (without head-rest), but afforded no relief. Parents now started with patient for New York to consult me. By the time they reached Louisville patient was so much worse, that father removed the plaster jacket last applied. Dr. Mussey, of Cincinnati, was consulted, as symptoms had become so alarming that parents durst not proceed further without something being done. The doctor, thinking the case one of Pott's, applied a plaster jacket, but as he did not use a jnymast, patient received very little if any relief. He then advised that patient be brought to me. During the journey to New York, the child completely lost the use of her lower extremities, and when the party reached the city a friend recommended that the child be taken to Dr. Hammond. The patient had, at this time, a very peculiar laryngeal breathing, at times stridulous, and a

constant dry, sharp, and hacking cough. Child was taken to Dr. Hammond, who ordered that the jacket be taken off, and sent patient to Dr. Wagner for a laryngoscopic examination. No disease being detected in the throat or larynx to account for the peculiar respiration, Dr. Wagner gave it as his opinion that, unless produced by reflex action from spinal irritation, probably it might be due to a foreign body in the trachea, as parents gave a history of the possible entrance of a foreign body into it, and, therefore, as a *dernier ressort* suggested tracheotomy. The operation was decided upon, and as I arrived in the city from Europe the day before it was to take place, I was requested to see the patient in consultation with Drs. Hammond and Wagner, and be present at the operation. By placing my hands

Fig. 44.



under the chin and occiput, and gently lifting her head, she stopped crying, and the peculiar respiration ceased immediately. When extension was removed, the peculiar respiration returned at once; pressure downward upon the head greatly aggravated it. This was confirmative proof of the reflex nature of the trouble. The child was now committed to my care, at the suggestion of Dr. Hammond.

October 3, 1877, patient first seen, with spondylitis of third, fourth, and fifth cervical vertebræ. Has a peculiar spasmodic cough and respiration, which is relieved by suspension. Ends very near shoulders. She is unable to stand an instant. Cries continually. Morbid fear very strong.

At my clinic at Bellevue Hospital I suspended patient, and applied a plaster jacket, with a head-rest. Spasmodic respiration disappeared immediately, and child could stand. On the following day she was so much improved as to run about freely without other support than jacket and head-rest. October 12. Runs about freely, and can jump without pain. Had no cough. Left for home. November 4. Letter states she has improved con-

stantly, "no nervous irritation or cough, nor lassitude." (See Fig. 44, from a photograph.) Letter from Dr. Bassett, dated May 13, 1878, states that, on May 1st, parents thinking child well, removed the jacket and head-rest, but as child was not so well afterwards he applied a new jacket with head-rest May 12th, which again made her comfortable. He had applied five jackets with head-rest since patient had returned to him. Jacket applied May 12th by Dr. Bassett was worn two months and then removed, child being brought to New York wearing no support whatever. It was thought advisable by me to apply a new jacket with head-rest, to be worn a few months longer simply as a protection. January 1, 1879. Patient remains well, wearing no support whatever.

Under treatment about ten months. Consolidated with very slight deformity. Six jackets used.

Case 79. Mary S., New Hamburg, N. Y., aged twelve years.

Robust and well developed. About October, 1874, sustained an injury to spine by falling with back upon stone. Pain in back lasted "some time." Kept quiet until recovery had apparently taken place. She, however, continued to complain from time to time till the summer of 1876, when, riding on horse-back, she was thrown forward on to the horse's neck, and thus strained her back. From this time up to the present she has grown worse, and has complained constantly. On Oct. 10, 1877, patient came under my charge, having slight deformity in lumbar region with symptoms of active inflammation involving first and second lumbar vertebræ; pain on pressure very marked, greatly relieved by suspension. Ordered to be leeches and placed upon her back, with ice applied. This treatment was continued until November 8th, when she was suspended and plaster jacket applied. March 20, 1878, jacket removed for the first time. Patient has been perfectly comfortable since the application, and has taken much exercise. Has had no pain. Tenderness over lumbar vertebræ much diminished. New jacket applied. May 23. Last jacket did not afford as good support as the first, as it did not extend down far enough. A new one was applied, carrying it very far down over the hips, after which she could bear firm pressure on head and jump on heels without pain. Nov. 25. New jacket applied, and worn until some time in Jan. 1879, when she was found consolidated.

Under treatment about fourteen months. Consolidated without any deformity. Four jackets used.

Case 80. Emma F. B., Bath, Maine, aged eighteen years. (Sent by Dr. Bibber, of Bath.)

No history of an injury. Complained of pain in the back and thighs since 1875. For six months, beginning April, 1877, she was unable to walk on account of pain in back and limbs. In July, 1877, Dr. Bibber diagnosticated Pott's disease. Under a general tonic treatment and rest she gradually recovered so far as to walk again. No mechanical treatment has been used.

November 8, 1877, patient first seen, having spondylitis of the first and second lumbar vertebræ, together with considerable lateral curvature. Suspension reduces both posterior and lateral curves, and relieves patient from pain. Patient limps when walking.

Applied plaster jacket during suspension of patient, which afforded her great relief. December 17. Lameness has disappeared, and pain entirely gone. New jacket applied. Lateral curve decreased. May 10, 1878. Patient entirely comfortable, and engaged at her daily labor. Is wearing jacket in the form of a corset as a protection.

Under treatment seven months. Consolidated. Two jackets used.

Case 81. Mary S., 262 West Tenth Street, aged eleven years.

Parents and three other children healthy. Patient healthy up to the beginning of her present trouble. In the spring of 1877 she fell down stairs, but did not complain much until some months afterward. She then had pain in chest and epigastrium. Head carried thrust forward.

Nov. 13, 1877, patient first seen, having spondylitis affecting vertebræ of middle dorsal region. Concussion, or pressure on sides of ribs, caused acute pain. No deformity, except the thrusting forward of the head; but that does not involve the diseased vertebræ. Suspension affords entire relief from pain.

Suspended patient, and applied a plaster jacket, which was worn until Dec. 4th, when it was cut down and gapped, as it had become too tight on account of child gaining so much in flesh. This was secured in position with a fresh plaster bandage. Jan. 23, 1878. Wearing jacket with entire relief from pain: no-

thing done. March 20. Went to my clinic at Bellevue Hospital, where old jacket was cut down, and the patient found apparently consolidated: a new jacket was applied, however, as a precautionary measure.

Under treatment about four months. Consolidated without any deformity.

Case 82. Wm. F. M., 21 Great Jones Street, New York, aged fifty-four years. (Sent by Dr. Austin Flint, Sr.)

History as written out by patient: Father died of phthisis; mother still living, aged seventy-eight years, and in fair health. First symptoms of spinal trouble appeared when eleven years old. Pain in left side. A year later laid up with fracture of *os femoris*. Spinal curvature appeared. Treated with issues and caustic for two or three years. Sensation of weakness in spine when walking. In the summer of 1865 all symptoms became aggravated, and the following winter legs became paralyzed. In May, 1866, Dr. Davis applied a spinal brace, which afforded some relief, so that during the following year he felt stronger than he had for several years previous. In the summer of 1870 had numbness of feet, felt insecure when walking, and experienced pain when riding. Was confined to bed for two months, after which consulted Dr. Taylor, who applied his spinal brace. Kept quiet for three months longer, and improved so that at the end of a year was able to walk. In February, 1874, began to suffer great pains on each side and in the abdomen, and for a while was treated for functional derangement of the colon. Became unable to walk, and kept his bed most of the time, but without relief. In April, 1874, symptoms of paralysis developed, and afterwards became unable to stand for a moment. About July 1, 1874, was taken to the Orthopædic Hospital on Fifty-ninth Street. Spinal brace applied by Dr. Shaffer, and patient kept upon his back. Brace worn constantly until November, 1874. Brace caused great pain, especially at night. Legs became greatly flexed, and they were bound down with straps. Improved until September, 1875, when he again became completely paralyzed in lower extremities. Actual cautery applied some dozen times without observing any immediate good, but during the following month sensation and motion began to return. Meanwhile the use of morphia hypodermically caused abscesses, which necessitated its discontinuance in this form, suppositories being

substituted. During December actual cautery used to combat symptoms of returning paralysis. Slight improvement.

November 20, 1877, patient first seen by me, having spondylitis involving sixth, seventh, eighth, ninth, and tenth dorsal vertebræ. Complete paralysis of both lower extremities. Has been confined to bed for three years and eight months.

Suspended patient with skin-fitting shirt, and adjusted dinner-pad, and applied a plaster jacket. Patient began at once to improve, and was no longer dependent on artificial heat to keep feet comfortably warm. November 26. Sat up three hours; and the greater portion of every day afterwards. About April 1, 1878, applied second jacket, which was cut down in two weeks, and a strip four inches wide removed, so jacket could easily be taken off, for purposes of cleanliness, without the danger of breaking, which would likely result from simple division. The large extent of jacket removed was a decided error. In fact the jacket should never have been divided, as the support which a divided jacket affords does not give the maximum amount of rest to the diseased parts which is obtainable by means of a jacket worn entire, and which is so essential to rapid consolidation. April 20, 1878. Letter from patient reports steady improvement. Sits up all day, and can walk a short distance without fatigue. Letter from patient, dated Owego, N. Y., Sept. 6, 1878, states that he got along very nicely with his divided jacket, which was made into a corset, until the first of July, when he experienced pain in the abdomen in the morning, which passed off after breakfast. This occurred every morning for a week before the cause was discovered. It was now learned that the rivets on both cut edges of the jacket were giving way. The probable explanation of the relief from pain after eating is, that the increased distension of the abdomen more completely filled the jacket, which had become loose by breaking down. This defect in the jacket being remedied at the hands of an ingenious harness-maker, no further trouble from that cause was experienced. The abdominal pains ceased entirely, and in a month he felt as well as before. He says he can now walk without the halting hesitating step, notwithstanding which there are days when he feels the necessity of a firmer support than that afforded by the present divided jacket.

When patient returned to the city, I desired to apply a new jacket to be worn entire, but this the patient refused to have

done on account of its preventing him from taking daily baths. He passed from under my observation to be taken care of by Dr. A. B. Judson, who has applied his modification of Taylor's brace, and very politely invited me to see the patient, which I did. I found Mr. M. wearing the most accurately adjusted steel brace I had ever seen, but patient stated that he was compelled to lie down most of the time with it on, and that extension was necessary in order to give the same relief which his first plaster jacket had done.

Remarks.—Judging from the progress of this case, and results of my treatment in similar cases, it is my opinion that had this patient worn his jackets entire from the time he first came under my observation up to the present, his spine would have been consolidated.

Case 83. Abbie G. W., Port Huron, Michigan, aged three-and-a-half years.

Healthy child. At fourteen months of age fell down stairs five steps. She was not inclined to move about for a day or two, but in a few days appeared to have entirely recovered, with the exception of being fretful. Was treated for worms, indigestion, and malaria. Pott's disease was diagnosticated fourteen months after the fall. She grew worse rapidly, and since the first week in November, 1877, at which time she had a fall, she has not been able to walk.

November 30, 1877, patient first seen, having spondylitis of seventh and eighth dorsal vertebræ. Unable to walk or stand. Intense pain caused by pressure on spine. Suspension diminishes deformity and entirely relieves pain.

Suspended patient and applied plaster jacket, which afforded her entire comfort. December 10. Jacket cut down on account of child's having chicken-pox, and secured by a roller bandage. January 10, 1878. New jacket. Child improved; can stand and walk alone. Left her home. May 15. Reported by friends to be entirely well, but is wearing jacket in the form of a corset for protection. January, 1879. Letter states that child remains perfectly well.

Under treatment about fourteen months. Consolidated with very slight deformity; three jackets used.

Case 84. Blanche P., Newark, N. J., aged four years.

Healthy until eleven months of age, when she had scarlet fever; afterwards had whooping-cough, and she became very much reduced. When two years of age she complained a great deal of pains in chest. Has never walked much since having scarlet fever. When Pott's disease was first discovered there was some deformity. Darrach's raw-hide jacket was applied, and a wheel-crutch used for locomotion, without which she could not walk.

Patient first seen Dec. 2, 1877, having spondylitis of the seventh, eighth, and ninth dorsal vertebræ. Deformity is reduced by suspension. Body inclined to the right. Unable to walk without support.

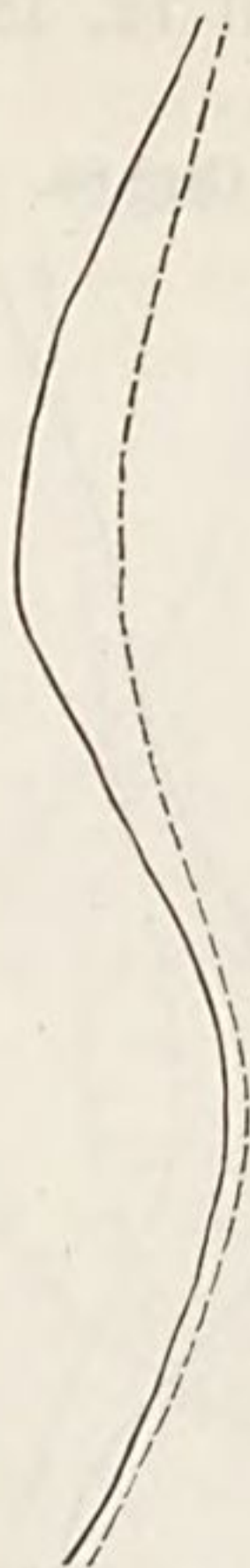
As there was a large boil over projecting vertebræ, patient was sent home to be kept in bed with poultices applied. In a short time patient returned and a plaster jacket was applied, which gave relief, though patient still inclined to the right. Subsequently another jacket was applied, which was removed March 24, 1878, and the deformity found diminished and spine in good condition: new jacket applied. June 5, new jacket applied. Aug. 7, old jacket applied at last date removed, and a new one applied. Continued improvement. April 15, 1879. Patient has outgrown old jacket: new one applied to-day. Continued improvement; can stand without jacket.

Case 85. Helen W., Bushwick Avenue, Brooklyn, L. I., aged nine years.

Parents healthy, although scrofula is supposed to exist in father's family. When two years old had "summer complaint," and was delirious. This was followed by a crop of small boils invading the entire surface of the body. Some weeks after this had trouble with eyes. It was noticed that, whenever she sat down suddenly, she would feel faint, and complain of pain in back. A year later small "hump" in dorsal region was noticed, which steadily became more prominent. No brace has ever been worn, being treated by swinging by arms, out-of-door exercise, and good food.

Patient first seen, December 7, 1877, having spondylitis affecting the seventh, eighth, ninth, and tenth dorsal vertebræ, forming a marked angular curvature. Suspension reduces deformity somewhat. Unable to sleep upon her side on account of pain produced.

Case 85.



Spinal Curvature before and during Suspension.

Patient was suspended with adjusted shirt and "dinner-pad," and a plaster-of-Paris bandage applied. Two weeks later had an attack of follicular tonsillitis. Feb. 15, 1878. Patient has been perfectly comfortable in the jacket. Sleeps on her side without pain, which she could not do before. February 18. Jacket first applied, being too tight, was divided in front, gapped, and then secured by a plaster bandage. May 22, 1879. One jacket applied since last date. Greatly improved; apparently consolidated; new jacket for protection.

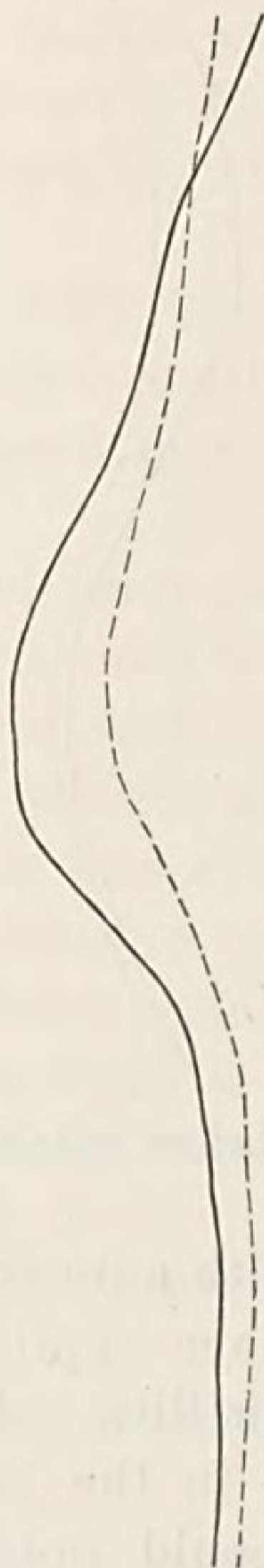
Case 86. Percy S., Rutherford Park, New Jersey, aged nine years.

Remarkably robust and strong. In the winter of 1876 fell upon the ice. Did not complain until June, 1877, when he began to have pain in the chest. In October, 1877, deformity scarcely perceptible, so parents say. Has had no treatment.

December 12, 1877, patient first seen, having spondylitis affecting middle dorsal vertebræ, with marked posterior deformity as well as lateral curvature.

Suspended patient, and applied plaster jacket, which made him perfectly comfortable. April 12, 1878. Has worn jacket first

Case 86.



Spinal Curvature before and during Suspension.

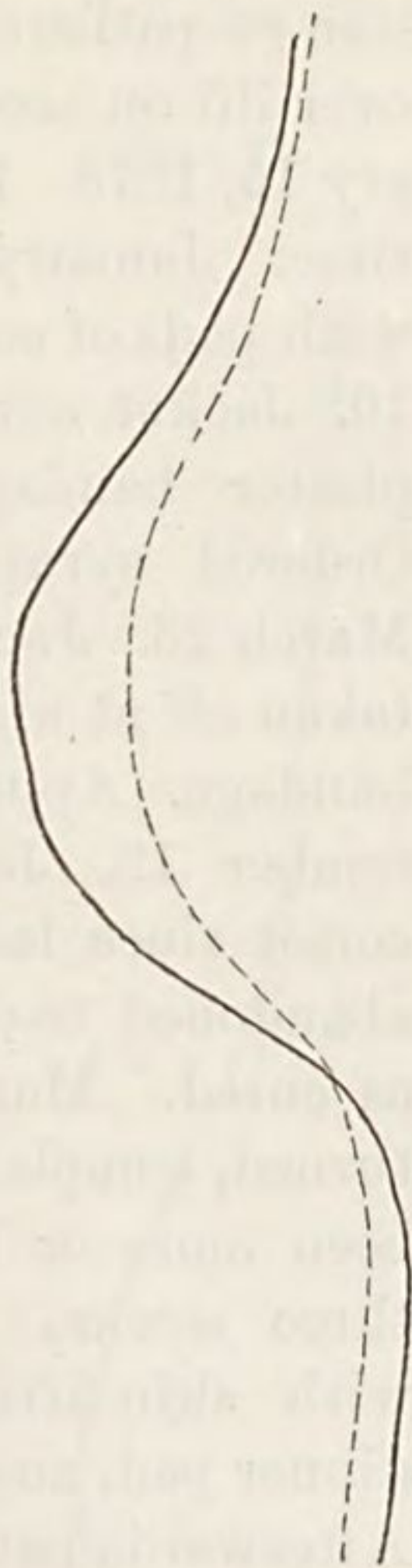
applied up to date without suffering pain or any inconvenience. Marked improvement in curvature, and in general health.

Case 87. Eugene D., Patterson, N. J., aged eight years.

No history of an injury; child taken care of by a nurse. When nine months old began to lean to one side, which was thought to result from debility following dysentery. A brace was applied by Marsh and worn two months. Dr. Wood, of Cooper Institute, then applied his brace, which was worn a year. A Taylor brace was then applied by Dr. Shaffer, and after a year Dr. Wood again applied his brace, which has been worn ever since. Deformity has steadily increased, so parents say.

Dec. 12, 1877, patient first seen, having spondylitis affecting middle dorsal vertebræ.

Case 87.



Spinal Curvature before and during Suspension.

Suspended patient at Bellevue Hospital, and applied plaster jacket. Could walk without other support, and was perfectly relieved from pain. He was one-half inch taller than before its application.

Case 88. Hannah J., 53 West Eleventh Street, New York, aged twelve years.

Parents healthy. Patient healthy until six years of age, when she fell down at school, and soon after began to walk with body inclined to one side. At this time deformity was scarcely perceptible. A Taylor brace was applied, and has been worn constantly ever since. Deformity has greatly increased.

December 13, 1877, patient first seen, having spondylitis affecting seventh, eighth, ninth, and tenth dorsal vertebræ. Deep

Case 88.



Spinal Curvature before and during Suspension.

sulci on either side of spine from pressure of brace pads. Suspension relieves deformity only slightly.

Applied plaster jacket during suspension of patient. Two fenestra were cut over ilii on account of pressure. January 15, 1878. Removed jacket for first time. January 17. New jacket applied with pads of cotton over ilii. February 10. Jacket cut down and secured by plaster bandage after being gapped. Ordered syrup lacto-phosphat. calcis. March 23. Jacket cut down so as to be taken off at night. Secured with roller bandage. Apparently consolidated. September 12. Jacket has been worn as corset since last date, but was entirely abandoned to-day. Patient discharged as cured. March 26, 1879. Patient returned, complaining of pain, which has been more or less constant for the past three weeks. March 29. Suspended with skin-fitting shirt, and adjusted dinner pad, and a plaster jacket applied. Afterwards patient expressed herself as at ease once more. April 20. Has been perfectly comfortable. Jacket to be continued for protection, although she appears to be thoroughly consolidated. Under treatment about sixteen months. Consolidated with marked deformity. Four jackets used.

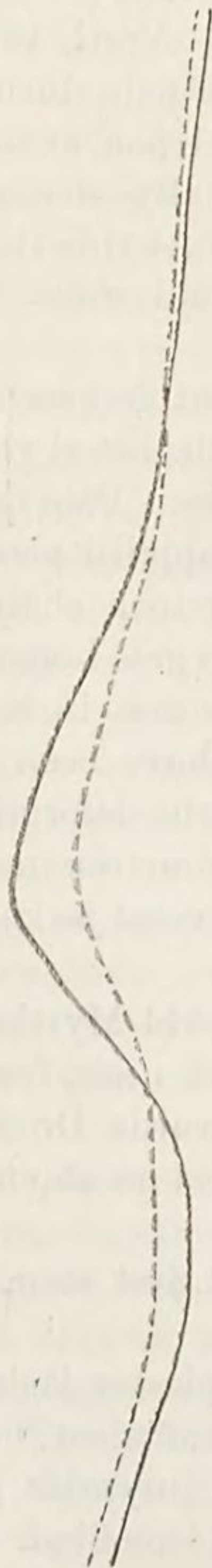
Remarks.—This case is instructive as showing the propriety of continuing the use of the jacket some time after apparent consolidation.

Case 89. Belle C., Towanda, Pa., aged twelve years.

Breech presentation. Father thinks child was injured at birth. When about two years old began to complain of pain in back. When three years old taken to Dr. Gross, who cauterized back, and kept issue discharging for six months. During this

time the horizontal decubitus was maintained. A Kolbé brace weighing fifteen pounds was applied and worn two years. Deformity steadily increased. She was taken to the Hospital for Ruptured and Crippled, where she remained a year, after which she was taken home in a condition of broken-down health.

Case 89.



Spinal Curvature before and during Suspension.

December 19, 1877, patient first seen, with spondylitis of twelfth dorsal and first and second lumbar vertebræ.

Suspended patient and applied plaster jacket, which afforded relief from all pains, and made a marked improvement in her shape. March, 1878. Jacket applied by family physician in Towanda. Child greatly improved.

Case 90. James H. T., Lewisburg, Pa., aged three and one-half years. (Brought by Dr. Wilson, of Lewisburg.)

Has had frequent falls. April, 1877, first noticed difficulty in walking. Complained of pain during micturition. Frequent and prolonged priapism. Upon examination Dr. Wilson diagnosed Pott's disease. By advice of Dr. Weir Mitchell a spinal brace was applied. At this time there was no projection of vertebræ, and child could walk. Since October, 1877, has been unable to walk.

December 26, 1877, patient first seen, having spondylitis affecting eighth, ninth, and tenth dorsal vertebræ. Unable to stand. Phimosis; adherent prepuce. Pale face and emaciated.

Suspended patient and applied plaster jacket, after which he could walk by holding on to a chair or table. Dr. Wilson is to circumcise him when he gets home. Letter March 17, 1879, states that father took the case in hand, and has succeeded admirably. Several jackets have been applied, and child is now consolidated with very slight deformity.

Under treatment about fourteen months. Consolidated with very slight deformity. Several jackets used.

Case 91. Albert W. S., 314 Myrtle Avenue, Brooklyn.

In 1877 fell and injured neck, for which nothing was done. About two months afterwards Dr. Sindrige, during an examination of the lungs, noticed an abnormality of the spine in the upper dorsal region.

January 3, 1878, patient first seen, with spondylitis of upper vertebræ.

Dr. Sindrige applied a plaster jacket with head-rest, but the support it afforded was insufficient, because the jacket did not fit close enough, and the jurymast pressed against the spine. Hence the patient was not benefited. I saw the patient for the first time February 7, 1878, and finding the jacket, which Dr. Sindrige applied, too loose, divided it in front, removed a strip, brought the edges together, and secured it with a fresh plaster bandage. Jurymast adjusted, after which patient expressed

himself entirely comfortable. March 8. New jacket applied and juremast raised.

Remarks.—The history of this case is instructive, as showing the necessity of the proper application of the jacket, for when improperly applied, a plan of treatment which has proved successful in many cases might be brought into discredit.

Case 92. Alonzo C. F., 85 Monroe Street, Brooklyn, aged thirty-nine years.

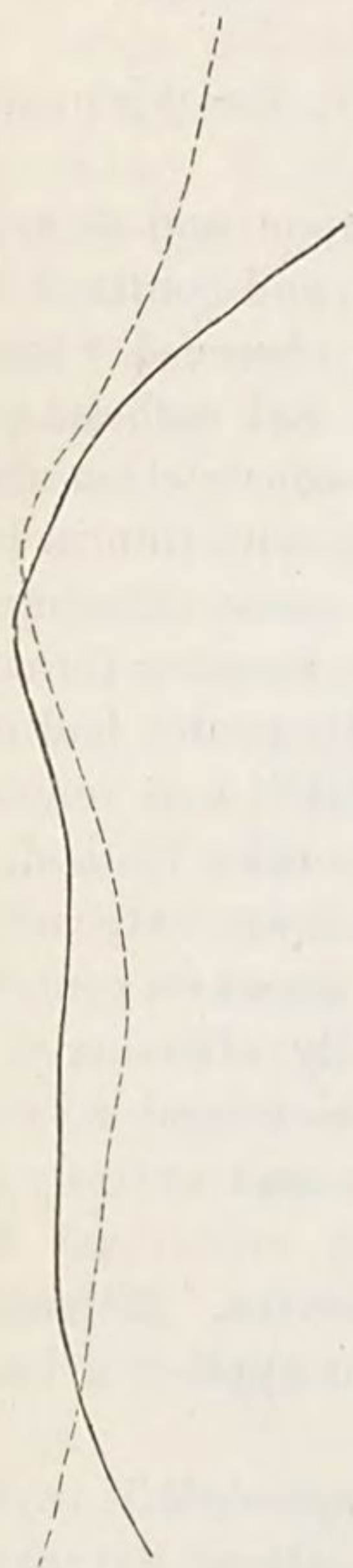
In January, 1855, was struck by a boat upon end of spine, which gave rise to considerable inflammation, and confined him to bed for several weeks. Six months later observed "lump" in upper dorsal region. Previous to this he had suffered pain in chest, and been annoyed by a sensation of constriction about the thorax. In a few weeks he felt a tingling sensation in legs, and rapidly lost sensibility and motion in lower extremities. Dr. Buck applied issue to back, and kept it running for some time, when he sent patient to Dr. Davis. His health had now declined materially. A brace was applied, but it was removed in a few weeks. In January, 1856, obliged to take his bed, being paralyzed in sensation and motion of both lower extremities. After twelve months recovered so as to go about on crutches, wearing a Davis' support. Brace was finally abandoned on account of the pain it produced. Remained in tolerable health until 1873, when he again began to decline, and entirely lost the use of his legs. Since then Dr. Seguin cauterized him three times a week over a period of several months. Nitrate of silver internally. Improvement. Dr. Knight applied a brace, but its support is insufficient.

January 14, 1878, patient first seen, with spondylitis involving upper dorsal vertebræ, together with lateral curvature. Hideous deformity. Unable to walk without crutches.

Suspended patient, and applied plaster jacket, which gave patient great relief for two days, when it broke down for want of strength. January 23. New jacket applied. Perfectly comfortable until March 1st. March 2. New jacket applied, but weakened by his wife cutting a fenestrum in it. This was removed March 16, and a new one applied. March 28. Bandage cracked over left hip, which was reinforced by additions of layers of plaster bandage. Injected $\frac{1}{6}$ grain strychnia into quadriceps of left thigh. Nothing more was heard from patient

until March, 1879, when he presented himself at my office, in answer to a letter of inquiry, wearing a copper corset, which had been made over the last plaster jacket applied by me. Nothing done.¹

Case 93.



Spinal Curvature before and during Suspension.

Case 93. J. C. R., St. John, New Brunswick. (Sent by Dr. Bayard, of St. John.)

Parents and four other children healthy. When four years old was thrown from sled and struck knee and back against a lamp-post. Two years later noticed stooping. He was confined to his bed for six weeks, then allowed to be up for three weeks, and then again put to bed for four months with a four-pound weight attached to each foot. In December, 1876, Dr. Bayard applied a plaster jacket without jurymast, and as the disease was high up it afforded no marked benefit.

January 16, 1878, patient first seen, having spondylitis affecting upper dorsal vertebræ.

Applied plaster jacket and jurymast during suspension of patient. This gave patient much comfort, and improved his position in a marked degree. Returned to St. John, and was placed under the charge of Dr. Bayard, who continued to apply the plaster jackets as occasion required. December, 1878. Reported cured. Under treatment eleven months. Consolidated.

Case 94. John G., Memphis, Tenn., aged five years.

Parents and other children healthy. Has had repeated falls.

¹ This case would probably have been benefited by the application of Dr. Stillman's modification of my jacket, which consists of two separate zones of plaster jacket, secured by iron ratchets for the purpose of keeping continuous extension.

About January, 1876, deformity first noticed. Complained of stomach pains, and was treated for worms.

January 22, 1878, patient first seen, having spondylitis of eighth, ninth, and tenth dorsal vertebræ. Deformity not reduced by suspension. Phimosis.

Plaster jacket applied during suspension of patient. Circumcised. February 4. Left for home in a comfortable condition. Can walk, run, and play without pain. April 25. Letter from Dr. W. C. Cowden reports patient as very much improved. No pain; very playful; and does not lean to either side. July 2. Patient returned, having come to New York on account of yellow fever epidemic. July 5. New jacket applied, but child behaved so badly as to interfere with its proper application. July 16. New jacket applied. August 12. Old jacket made into a corset, and is to be worn as a protection for some months, although patient is now apparently consolidated.

Under treatment one year, six months, and twenty-two days. Consolidated with deformity nearly the same as when treatment was begun.

Case 94.

Spinal Curvature before and during Suspension.

Case 95. James S., Brooklyn, L. I., aged four years.

When two years of age fell down stairs and struck upon his back, after which he complained of pain in his stomach. Treated for indigestion, worms, etc. Carried his head thrown forward. Knight's brace applied and worn for a year.

Jan. 24, 1878, patient first seen, with spondylitis of seventh cervical and first, second, and third dorsal vertebræ. Suspension relieves pain, but does not change the deformity. Great pain upon motion or slight concussion.

Plaster jacket with head-rest applied during suspension. Perfectly comfortable until March 19, when jacket gave way. Ap-

plied new jacket, which again made patient comfortable. May 21. Much improved, wearing same jacket. Aug. 2. New jacket

Case 95.



Spinal Curvature before and during Suspension.

applied with head-rest. Child could readily walk about without jacket and without placing hands upon anything to support himself.

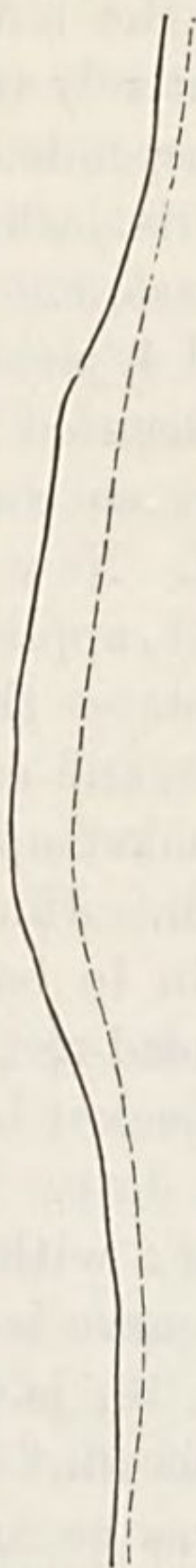
Case 96. Lizzie B., Reading, Pa., aged two-and-a-half years.

Parents healthy; only child; always delicate. Nursed until fifteen months old. In July, 1877, fell down two steps from a carriage, striking upon her back. Soon after she complained of pain in epigastric region, and lost the use of her legs to a certain extent. Upon examination February 2, 1878, father discovered undue prominence of lower dorsal vertebræ. No treatment has been used.

February 8, 1878, patient first seen, with spondylitis of eleventh and twelfth dorsal vertebræ. Direct pressure over promi-

nence when child is extended across the lap relieves pain. Compression of ribs causes pain and muscular twitchings.

Case 96.



Spinal Curvature before and during Suspension.

Suspended patient, and applied plaster jacket, when child could walk without pain.

Case 97. Alice S., 949 Lex Avenue, New York, aged three years and eight months. (Brought by Dr. Blumenthal.)

Parents healthy. When two and a half years old patient fell from a chair, striking upon the back of her head. After this she developed a peculiar cough, which mother thought was croup. The cough was only present at times, but by Jan. 1, 1878, it had become quite constant, and it was now thought she had bronchitis. A few weeks later patient was noticed to walk leaning over sideways, and complained of pain in left side. She

was taken to Dr. Blumenthal, who diagnosticated lateral curvature of the spine and brought her to me.

When patient was first seen there was spondylitis of sixth and seventh dorsal vertebræ, accompanied with lateral curvature; the superior curve to the left, the inferior curve to the right. Suspension almost entirely relieves deformity.

Feb. 19, 1878, patient suspended with adjusted shirt and dinner-pad, and plaster-of-Paris jacket applied, after which patient could run about with ease, but could not jump. Ordered cod-liver oil and iron. April 4, jacket too tight; patient growing; cut down, gapped, and secured in position with roller bandage. April 8, returned not so comfortable since division of jacket. Could not walk well. New jacket applied, and she ran out of office happy. April 11, applied a new jacket with head-support. April 15, mother states that patient has slept better since application of head-rest, and eats better. Increased color of cheeks. May 30. New jacket applied without head-rest, as child had improved so much. June. Child not so well since last date. Complains of pain in back, and her cough has returned. New jacket with head-rest applied. Aug. 23, patient has increased in size so that jacket is too small. Has been well and free from pain since last date. New jacket with head-rest. Sept. 13. Can stand and walk without any support whatever, and without pain. Lateral curve is entirely obliterated. New jacket with head-rest. Nov. 13, jacket cut down three weeks after its last application on account of child receiving an injury and breaking it. Jacket was secured with a roller bandage. New jacket with head-rest to-day. April 24, 1879. New jacket applied some days ago. To-day head-rest was added, as lifting of head made her more comfortable. Can jump and run about without the least pain. Only time she has pain is when she hiccoughs.

This case is instructive as illustrating the necessity of the "jnymast," or head-support, even when the disease is low down in the dorsal vertebræ, as suggested to me by Dr. S. W. Gross, of Philadelphia.

Case 98. Joseph E., 335 West 36th Street, New York, aged three years.

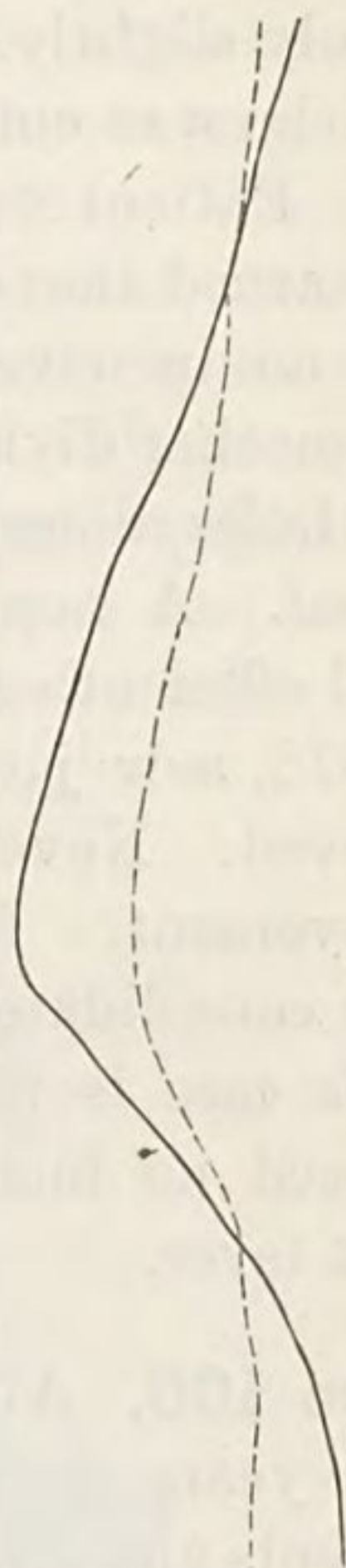
Parents and nine other children living and healthy. Lost three children, two still-born, one of whooping-cough. Child

healthy. When thirteen months old had a fall, fracturing arm in upper third, and bruising himself severely in the region of the scapula. When a little over two years of age, mother noticed small lump upon child's back. Patient was taken to Forty-second Street Hospital, where a brace was applied, and has been worn ever since, except occasional removals on account of pain produced by it. Deformity increased, until it is now as seen in dark line. Since February 1, 1878, has been unable to stand, and has constant grunting respirations.

February 20, 1878, patient first seen, having spondylitis affecting seventh, eighth, ninth, and tenth dorsal vertebræ. Suspension relieves patient, and reduces deformity to dotted line. Unable to stand.

Suspended patient at Bellevue Hospital clinic, and applied plaster jacket, which made patient comfortable. September 3, 1878. Mother called with patient. Two jackets have been applied since last date at Outdoor Department. Last jacket has been removed seven weeks, as back was the seat of an eruption. Until within a week, patient has been getting along nicely, but since then has been restless, and goes stooped over more than normal. New jacket applied. April 26, 1879. New jacket applied. Child much improved.

Case 98.



Spinal Curvature before and during Suspension.

Case 99. Agnes McN., 143 Washington Street, New York, aged five-and-a-half years.

Parents and three other children healthy. Was a strong and healthy child. At three years of age she had diphtheria, since which she has been delicate. About August, 1876, she slipped down stairs, striking with back against edge of step. She did not complain much of her back for some time, but in about three months it was noticed that she walked with her body tipped to one side, and she complained a great deal of "stomach-ache;" was restless at night, and would cry out in her sleep.

February 22, 1878, patient first seen, with spondylitis of third, fourth, and fifth dorsal vertebræ. Very much emaciated. Deformity is lessened by suspension.

A plaster jacket was applied during suspension, but it relieved her only slightly. A head-rest was added, and when this was done she was entirely comfortable, and moved about with freedom. Patient was not seen again until June 25, 1878, when it was learned that she had had an attack of scarlet fever, and suffered no inconvenience from the jacket. About the first of May, mother divided jacket in front, it having become too tight, made holes along out edges, and laced it up after the fashion of a corset. A new jacket with head-rest was applied, which afforded efficient support and entire comfort to patient. August 12, 1878, new jacket and head-rest applied. Child very much improved. November 4. New jacket and head-rest. Continued improvement. February, 1879. New jacket. Patient apparently consolidated.

This case is interesting, as showing that the plaster jacket produced no inconvenience even during the eruptive stage of scarlet fever.

Case 100. Alice M., 634 Fifth Avenue, New York, aged twelve years.

Parents and seven other children remarkably healthy. Patient stout and healthy. In the latter part of December, 1877, patient fell while upon the ice, hurting herself so that she could not walk home.

When first seen, patient had spondylitis affecting lower dorsal and first lumbar vertebræ. Intense pain, which was entirely relieved by suspension. Very slight deformity perceptible upon careful examination.

March 5, 1878. Suspended patient and applied plaster jacket, making her perfectly comfortable. This jacket was worn until May 11th, when a new jacket was applied. A third jacket was applied October 10, and worn until about the first of March, 1879, when upon its removal the vertebræ were found to be thoroughly consolidated.

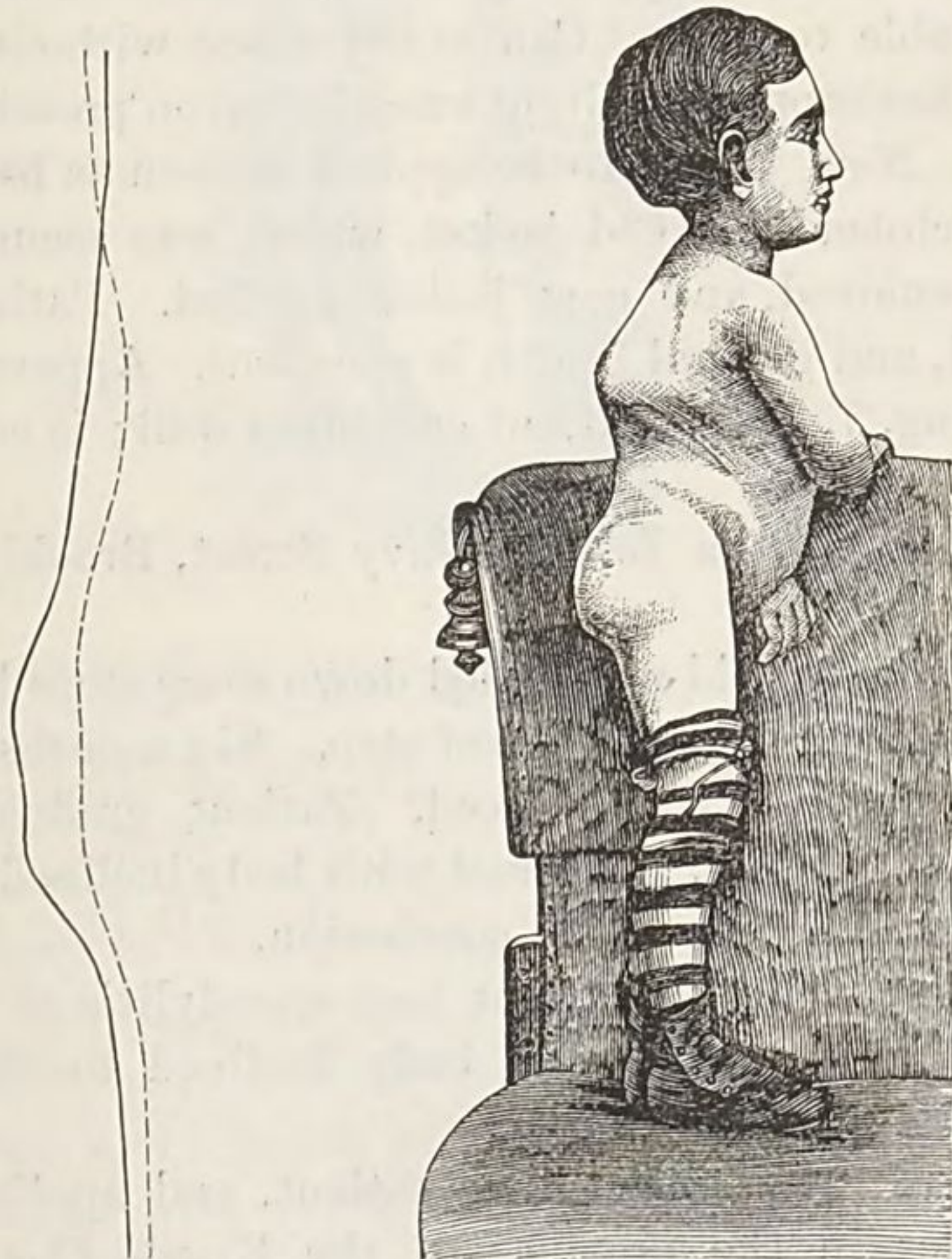
Under treatment about one year. Consolidated without the slightest deformity. Three jackets used.

Case 101. Jacob B., Saratoga Springs, New York, aged three years and six months.

Parents and other children healthy. Patient always healthy and robust until two years and a half old, when he began to have epigastric pains. About this time a "lump" was noticed upon middle of back. Patient taken to Dr. Grant, of Saratoga, who diagnosticated Pott's disease. In May, 1877, Dr. Grant applied a gypsum bandage during suspension, but without any shirt. He placed a strip of pasteboard on either side of the spine, and secured them in position with a roller bandage, over which the plaster bandage was applied. Child was perfectly comfortable for three weeks, when he began to suffer greatly. Upon removal of jacket extensive slough was found over projecting spine, the result of pressure, the pasteboards having slipped and become softened. This slough continued to discharge for some time.

Case 101.

Fig. 45.



Spinal Curvature before and
during Suspension.

In July, 1877, Dr. Waterman, of Forty-ninth Street, took charge of the case, and December 24 of the same year applied a Taylor brace. February 25, 1878, Mr. Darrow, instrument-maker, applied another brace, but pain was so great that it was discarded.

When first seen, patient had spondylitis affecting the eighth, ninth, and tenth dorsal vertebræ; marked deformity, which is somewhat relieved by suspension by head and axillæ. Unable to stand without support. Patient favors greatly his right limb, the foot of which is markedly varus. This condition, however, has lasted only two weeks. Spinal curve before and during suspension as shown by continuous and dotted lines. Fig. 45, from a photograph by O'Neil, shows deformity.

March 6, 1878. Suspended patient with skin-fitting shirt and adjusted "dinner-pad" before the class at Bellevue Hospital, and applied a plaster jacket. March 7. Patient can stand without other support, and can take a few steps, but right leg is very weak. March 12. Foot has become perfectly straight. May 15. Continued improvement. New jacket. Going to the country. October 15. Great improvement. For past six weeks patient has been able to walk. Can stand alone without jacket and without other support. Slight excoriation on prominence caused by jacket. New jacket to be applied as soon as back is in condition. October 31. Old jacket, which was secured by roller bandage, removed, and new jacket applied. Patient eats and sleeps well, and general health is excellent. Apparently consolidated. Aug. 7, 1879. Patient continues well; is consolidated.

Case 102. Bertha L., 260 Navy Street, Brooklyn, aged six years.

When five years old was pulled down some steps by sister, and struck with back against edge of step. Six months later prominence of vertebræ was noticed. Patient gradually lost her strength and appetite. Walked with body inclined to the right and with great care to avoid concussion.

When first seen, the patient had spondylitis of upper dorsal region. Patient walks with body inclined to the right, and with hands resting on thighs.

March 11, 1878. Suspended patient, and applied plaster-of-Paris jacket in the presence of the King's County Medical Society, after which child could walk erect and without placing hands on thighs. Was relieved of all pain. Will require jurymast, as disease is located so high up. March 15. Added a jurymast to jacket, which was applied on the eleventh. Fig. 46, from a photograph, by Kempf, showing patient with head-rest applied. April 30. Continues to feel well. August

20. New jacket with head-rest applied. Patient has improved greatly. November 27, 1878. Jacket worn since last date, cut down in front so that it may be removed to wash patient. She has been jumping rope of late. December 20. New jacket applied.¹

Fig. 46.



Case 103. George S., 220 Elizabeth Street, aged eight years.

Parents and four other children healthy. Patient healthy until four years of age. At this time he began walking lame, and examination showed undue projection in dorso-lumbar region. Taken to Outdoor Department of Bellevue Hospital, where Dr. Judson applied a steel brace, which was worn for six months. Then taken to Forty-second Street Hospital, where a Knight's brace was applied, but it could not be worn with any comfort. When patient was six years of age, Prof. Stephen Smith placed him in Bellevue Hospital, where a plaster jacket was applied and worn without improvement. At the end of six months he left the hospital, but returned once a month to have

¹ May 8, 1879. Patient returned wearing jacket applied the twentieth of last November. Has continued to improve without an unfavorable symptom. Jacket cut down and secured in position by a roller bandage. This is to be worn a while for protection.

a new jacket applied. Very little, if any, improvement took place. In March, 1878, patient was taken to Prof. Post's clinic, but as patient had been wearing a plaster jacket without benefit, he kindly sent the patient to me for an explanation of his non-improvement. March 25, 1878, I examined patient for the first time, and discovered that he had been put up with a blanket rolled about body instead of using a skin-fitting shirt. Excoriations caused by blanket becoming wrinkled, and sufficient care had not been taken in applying jacket.

When first seen, the patient had spondylitis of ninth, tenth, eleventh, twelfth dorsal, and first lumbar vertebræ. Excoriations upon back.

March 27, 1878. In the presence of Prof. Post and Dr. Cooper of Georgia, suspended patient with skin-fitting shirt and adjusted dinner-pad, and applied an accurately fitting plaster jacket. When "set," child could walk without pain, and expressed himself as perfectly comfortable. Subsequently, on several occasions, Prof. Post exhibited this child at his clinic, suffering no pain whatever and progressing favorably.¹

Case 104. Edgar P., Richmond, Va., aged about five years. Parents and three other children quite healthy.

When the patient was first seen there was spondylitis of sixth and seventh dorsal vertebræ. Marked deformity. Partial paralysis of lower extremities.

April, 1878. Suspended and a plaster jacket applied. A head-rest was suggested, but when jacket was applied patient was so comfortable that its use was considered unnecessary. Patient was taken back to Richmond, and cared for by Dr. Landon B. Edwards. I saw the patient in the October following, and he appeared to be consolidated. His health was excellent, and had been since the first jacket was applied.

Under treatment about six months. Consolidated with marked improvement in deformity.

Case 105. Frank S., Mount Joy, Lancaster Co., Pa., aged eight years.

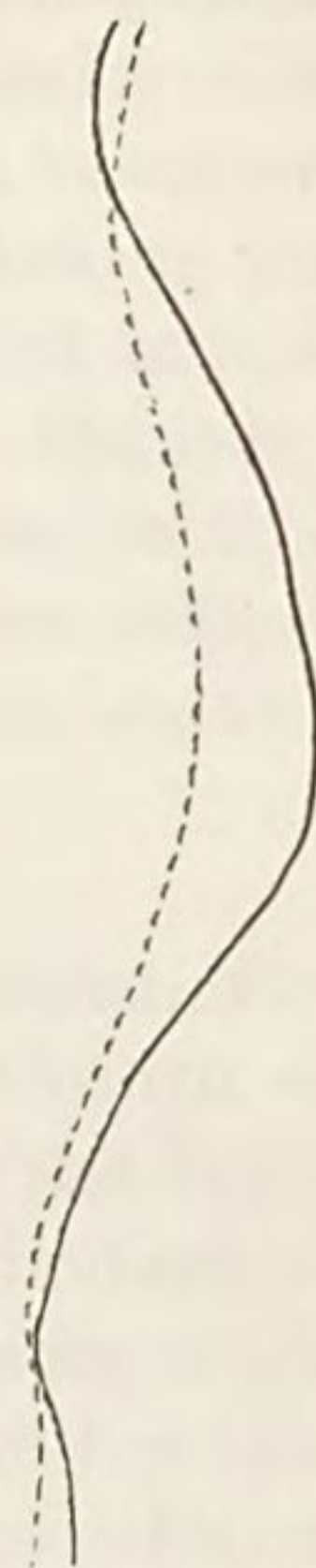
¹ July 7, 1879, patient called at office, wearing plaster jacket applied by Dr. Quimby at Bellevue Hospital. Case is progressing favorably, patient being now consolidated. Eats and sleeps well. Probably has been consolidated for some weeks, as parents state he could jump freely when jacket was off.

Parents healthy. Child strong. Has had repeated falls. In October, 1873, first noticed trouble in back, stomach, and chest. Six months later noticed peculiarity in carrying hands and arms. Dr. Agnew, of Philadelphia, applied Gemrig's spinal brace, which was worn one year with some benefit. Darrach's raw-hide jacket was then substituted in conjunction with the wheel-crutch. In the mean time patient became paralyzed in lower limbs, but paralysis was improved during the use of salt-water baths and friction. Subsequently brace broke and paralysis increased.

April 28, 1878, patient first seen, having spondylitis of upper dorsal region. Adherent and constricted prepuce. No control over lower limbs. Strong, robust-appearing child. Reflex action of limbs is marked when irritation is applied to sole of foot. Suspension reduces curve to dotted line.

Patient suspended and a plaster jacket applied, after which patient could flex and extend his lower extremities. Frenum nicked and adhesions broken up. The following day he was taken home to be cared for by parents. This patient was not heard from again until March 18, 1879, when, in answer to a letter of inquiry, it was learned that after having worn the plaster jacket months after it had ceased to give efficient support, it was abandoned for a steel brace with a head support. Legs have become greatly contracted, and he has no use of them whatever, although he eats and sleeps pretty well.

Case 105.



Spinal Curvature before and during Suspension.

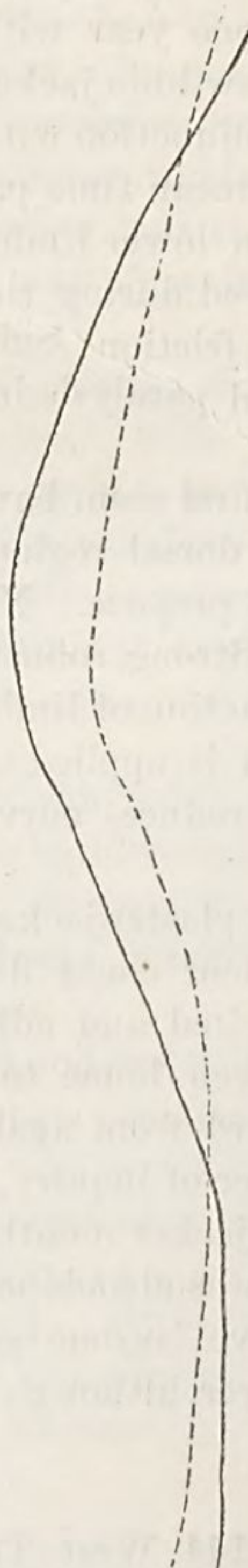
Case 106. Albert M., 144 West Thirty-fourth Street, New York, aged fifteen years. (Brought by Dr. Hertzog.)

When three years of age received an injury to his right shoulder by falling down stairs, which resulted in complete ankylosis at that joint with atrophy of the muscles. Has always been healthy, with the exception of several attacks of pleurisy which began in April, 1876. There has never been any

effusion during these attacks. Dr. Hertzog suspected spinal trouble some weeks ago, and brought him to me.

When first seen, the patient had spondylitis of middle dorsal

Case 106.



Spinal Curvature before and during Suspension.

vertebræ, with marked kyphotic curve. Pressure over ribs articulating with diseased vertebræ causes great pain.

May 3, 1878, suspended patient and applied plaster jacket, which was cut out over abdomen two weeks later. June 1,

since jacket was cut out over abdomen it has been perfectly comfortable, except now upon hips, where it has become too tight. New jacket applied. June 3, jacket removed, as it did not fit patient, and consequently afforded insufficient support. A new one was applied, making him entirely comfortable. June 19, made into a corset. Improved. August 26, has worn jacket as corset up to date. No pain. Has been taking sea-baths, playing football, etc. New jacket applied, which is to be made into a corset. Patient almost consolidated. October 4, new jacket applied, and is to be worn entire. November 2, wearing jacket last applied. Can bear forcible concussion without pain. December 30, jacket removed. Consolidated in less than eight months. Five jackets used.

Case 107. Mrs. John S., 228 West Fiftieth Street, New York.

Always healthy until 1868, when she was thrown down in leaving a railway car, breaking the nasal bones and bruising her severely. One year afterwards, noticed pain in back at dorso-lumbar junction. This continued for eight years, when in addition she began to experience pain at the end of her spine when sitting down. Was kept on her back for two months, and back painted with iodine and sponged with warm water, but no improvement took place.

When first seen, patient had spondylitis affecting middle dorsal vertebræ, with lateral curvature. Very tender upon pressure over diseased vertebræ. Self-suspension entirely relieves patient from pain, and brings spine into normal position. Fine figure. Constant sense of fatigue.

May 13, 1878. A plaster jacket was applied while the patient was self-suspended, which made her perfectly comfortable. Daily self-suspension recommended. June 1. Comfortable and entirely relieved of pain and sense of fatigue. Jacket cut down in front and made into corset. July 3. Strip one inch wide removed from each side of corset, and then reapplied during self-suspension. Form perfect. Exercise without fatigue. September 14. Returned from the country. Has exercised freely. Health perfect. Corset removed. Can bear concussion and rotation without an unpleasant symptom. Cured. Permanent corset made of cloth with steel springs.

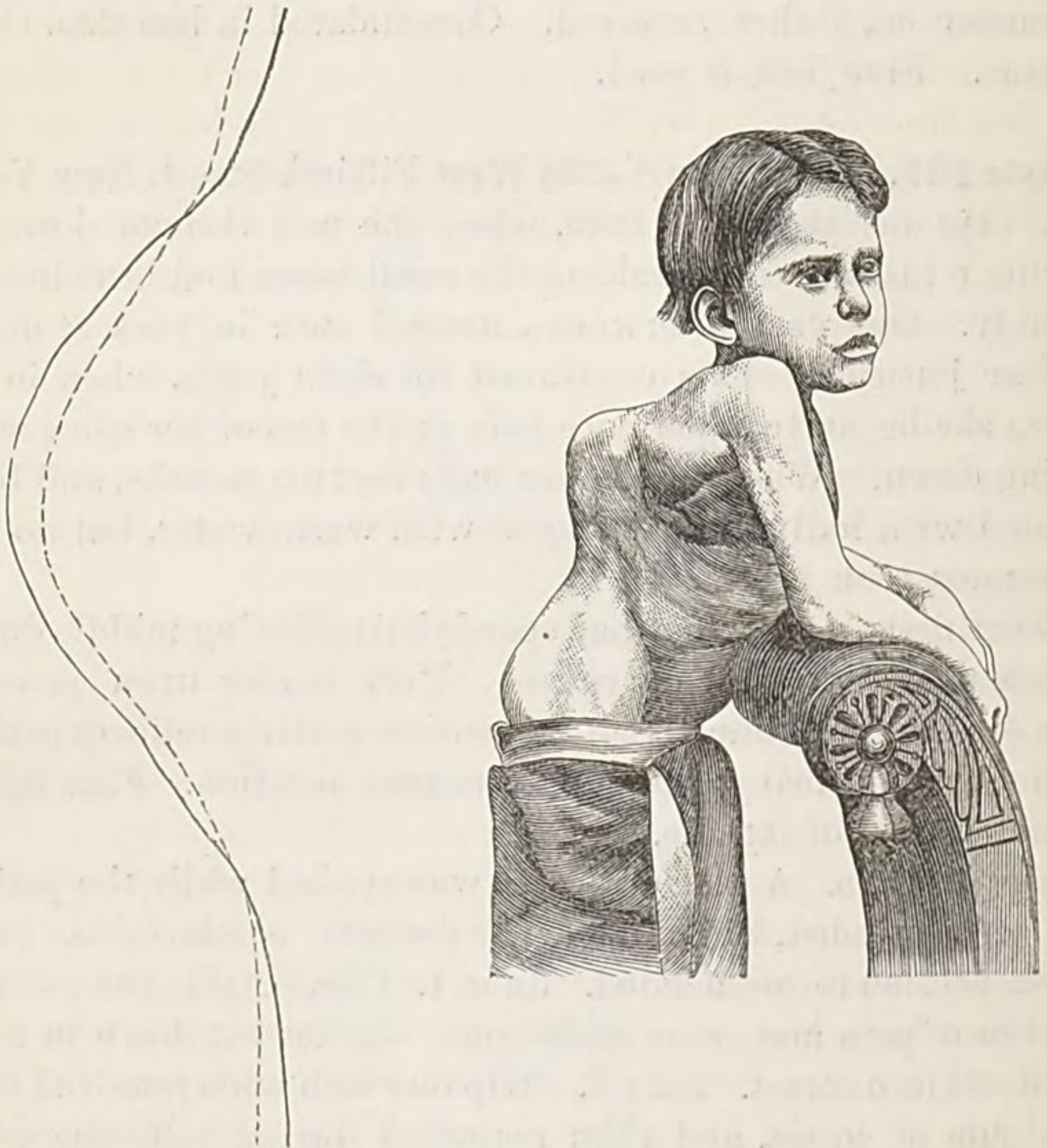
Under treatment about four months. Consolidated without deformity. One jacket used.

Case 108. Frederick S., corner Twenty-sixth Street and Sixth Avenue, New York, aged nine years.

Healthy parents. Very robust and strong boy. When four and one-half years of age he fell down stairs, striking upon his back. Six months later undue prominence of dorsal spine noticed. Pain in back. Taken to Hospital for Ruptured and Crippled, where a brace was applied, which has been worn ever since. A Taylor brace was applied, but he could not wear it on account of pain it produced. Curvature has steadily increased.

Case 108.

Fig. 47.



Spinal Curvature before and during Suspension.

When first seen, patient had spondylitis affecting dorsal vertebrae from seventh to twelfth inclusive, with very bad deformity (see Fig. 47, from photograph). Unable to stand without placing hands on thighs. Suspension relieves pain entirely.

May 17, 1878. Suspended patient with skin-fitting shirt, and

adjusted dinner-pad, and applied a plaster jacket, which made patient entirely comfortable. February, 1879. Jackets have been applied from time to time, as occasion demanded. Upon removal of jacket, examination shows that thorough consolidation has taken place. Is to wear jacket as corset for a while longer as protection.

Under treatment about ten months. Consolidated without change in deformity.

Case 109. Hamilton M., Great Neck, L. I., aged two-and-a-half years.

Parents and three other children healthy. Patient always rather delicate, but never sick until a year and ten months old. At this time he was very fretful, and began to lean to one side, carrying the left shoulder lower than the right. He was teething. He was examined carefully by three physicians, who attributed his whole trouble to "weakness." Four weeks after child first complained, mother detected lateral curvature of the spine. Patient was then taken to Dr. Joseph Bryant, Sept. 10, 1878, having spondylitis affecting lower dorsal vertebræ with slight posterior deformity. Decided lateral curvature, involving lower dorsal and lumbar vertebræ. Oct. 3, 1878, deformity in upper dorsal region had made its appearance.

Dr. Bryant suspended patient and applied a plaster jacket, which was worn until Oct. 3, when patient returned and I saw him for the first time. He had now a well-developed deformity in the upper dorsal region, and had partially lost the use of his legs, being unable to stand unless resting his hands upon thighs. I suspended the boy and applied a plaster jacket, adding a head-rest as soon thereafter as it could be made. After this he could stand and walk with comfort. April 30, 1879, jackets with head-rest have been applied as occasion demanded ever since child came under treatment. The lateral curve, together with the kyphosis in the lower dorsal region, has now entirely disappeared, and from all appearances I judge that the vertebræ in the lower dorsal region are thoroughly consolidated. Deformity in upper dorsal region has improved greatly, and although I believe consolidation has also taken place here, I do not think it advisable to discontinue the use of jacket and head-rest just yet, and hence will not include this case among the cured.¹

¹ Oct. 29th. Father of child called to-day, saying that the child was now in Paris, and was perfectly well.

Analysis of 109 Cases of Spondylitis Treated by Suspension and the Plaster-of-Paris Bandage.

LOCATION OF THE DISEASE.	Number.	Males.	Females.	Under 8 years.	Between 8 and 15 years.	Between 15 and 25 years.	Over 25 years.	Average age.	Age not recorded.	Good family history.	Bad family history.	Family history not recorded.	Traumatic origin.	Cause unknown.	Unable to walk or stand before treatment.	Able to walk or stand after application of jacket.	Became paralyzed during treatment.	Consolidated.	Average duration of treatment by GYPSUM bandage.	Now under treatment.	Wearing iron braces.	Dead.	Not heard from.	Abandoned all treatment.
Cervical region, . . .	4	3	1	4	0	0	0	8	0	3	1	0	3	1	2	2	0	2	8 mos. 24 days.	1	0	0	1	0
Dorso-cervical, . . .	2	2	0	1	1	0	0	6 $\frac{1}{2}$	0	1	0	1	2	0	1	1	0	0	10 mos. 23 days.	0	0	1	1	0
Dorsal, . . .	83	52	31	46	27	1	5	10 $\frac{2}{3}$	4	46	9	28	55	28	32	28	1	49	1 yr. 3 m. 14 days.	13	3	1	17	1
Dorso-lumbar, . . .	12	5	7	4	6	1	1	9 $\frac{9}{12}$	0	8	1	3	6	6	1	0	0	8	7 mos. 28 days.	0	0	0	4	0
Lumbar, . . .	6	3	3	3	2	1	0	9 $\frac{1}{3}$	0	1	1	4	3	3	2	2	0	6	1 yr. 2 m. 6 days.	0	0	0	0	0
Not recorded, . . .	2	1	1	1	0	0	1	14	0	1	0	1	2	0	0	0	0	0	1 yr. 3 m. 25 days	0	0	1	1	0
Total, . . .	109	66	43	59	36	3	7	9 $\frac{2}{3}$	4	60	12	37	71	38	38	34	1	65	1 yr. 5 d.	14	3	3	23	1

APPENDIX.

THE note or history of the following cases was received from Mr. David Harrison, F.R.C.S., Surgeon to the Royal Infirmary at Liverpool. It was received too late to incorporate in my paper, but the cases are so important that I have added them as an appendix.

WILLIAM SMITH, æt. 31, cotton porter, admitted July 26, 1877. In May, 1876, first experienced great pain after his day's work opposite the sixth dorsal vertebræ. This was so severe that he could not sleep at night, but passed off towards morning sufficiently to enable him to go to work again. Symptoms became gradually worse until end of July, 1876, when he was obliged to discontinue work. Legs by this time had become weaker than usual, and this weakness increased until they shook under him when standing. He also began to suffer from pains shooting round chest, and his back became so sensitive to the slightest shock that he felt afraid to walk upon any uneven surface, and was seized with the most intense pain upon stepping from the pavement into the road.

September, 1876. Was sent to Bexton Convalescent Hospital to be treated for rheumatism, and during his stay there a small projection upon his back was first observed. A few days after this discovery, he found his legs to be quite powerless, but sensation, although much impaired, was not entirely lost. This paralysis extended as far up as the projection in the back. He gradually lost control over his motions, but could retain his urine, although he had great difficulty in voiding it.

Towards end of October the projection increased in size until a very obvious curvature was developed.

From this time to July, 1877, he alternately became better and worse under the treatment adopted, which principally consisted in counter-irritation over spinal region and internal administration of strychnine.

July 26th. Was admitted into Liverpool Royal Infirmary completely paralyzed in lower half of body, having no control over rectum or bladder, passing both urine and motion under him.

August 7th. Prof. Sayre suspended him and applied plaster-of-Paris bandage, stating at the time that this was a case in which a juremast ought to be used.

9th. Pain greatly relieved. Patient could, by placing a great deal of weight on his arms, actually stagger round his bed.

21st. Regained complete control over rectum and bladder. The pain in the back and in course of intercostal nerves has been steadily abating since 9th instant, but no further improvement with regard to the paralysis has taken place; the plaster has given way in places.

22d. Cut off old plaster jacket, and suspending again applied a fresh bandage with a jnymast, the head supported from this long strap coming beneath chin and occiput and fastened to strong India-rubber bands.

23d. A very surprising improvement, patient being able to walk across ward with the aid of a stick.

26th. Able to walk without any external support, but with an uncertain gait. Pain in back less, and pain in course of intercostal nerves quite gone. Sensation in lower part of body and limbs improved.

October 4th. Suspended again and another bandage applied, a tracing of curvature being taken. Pain in back hardly perceptible for some time.

December. No pain in back; can walk quite well.

March, 1878. Left infirmary with plaster bandage on, with the intention of resuming his work of cotton porter.

March, 1879. Has been working at cotton portering during last twelve months, lifting tons of cotton during each day, but in spite of this severe work has steadily improved in health, and never been absent from his work with the exception of one week during this time. Discarded the plaster-of-Paris bandage nine months ago, and since that time has worn a pair of (stiff) woman's stays with the view of keeping strain off back to some extent.

JOHN HAWLEY, æt. 30, admitted July, 1877. Lumbar abscess. In October, 1876, sprained his back by sudden and violent exertion. (Jumping on to a chair, with considerable weight balanced above his head.) Following morning could not raise himself in bed without help. Great pain in back (lumbar region) upon bending to take anything from ground; could not dress without help. But having once gained the erect position could maintain it without pain, and was able to continue his work. These symptoms increased in severity until end of January, 1877, when he was obliged to discontinue his work.

Towards end of March (1877), happened upon one occasion to look at his back in the glass, and observed a swelling size of a hen's egg a little to the left of the spinous processes of lumbar vertebræ and about two inches above the crest of hip bone.

At the end of May he was examined at this hospital, and an abscess was discovered to the left of the lumbar region over the quadratus muscle, rounded in shape, two-and-a-half inches in diameter: not being admitted. *He applied for admission in July*, and the swelling was then found to be eight inches in diameter; skin not at all thinned over it. Could only walk very slowly with help of stick and only with pain.

August 7th. Suspended and plaster-of-Paris bandage applied, a window being made over site of abscess and latter aspirated through it, fifteen ounces of pus being drawn off.

15th. Could walk without the slightest pain, and was instructed to get out in the air as much as possible.

October 1st. Aspirated abscess; eight ounces drawn off.

30th. Four-and-a-half ounces of pus taken away.

November 20th. No re-collection of pus, and patient discharged apparently quite well with jacket on.

ANN CALDEMOOD. *January*, 1875. Pott's disease. Angular curvature seventh and eighth dorsal vertebræ (very sharp); walks with great difficulty and with hands upon her knees. Grunting respiration can be heard at considerable distance; will not move except when compelled, and then with great pain; this felt in back at point of curvature, and shooting round the ribs.

Plaster-of-Paris bandage applied *January*, 1875. Breathing and pain greatly relieved, but still supports herself by placing hands on knees.

September, 1878. Is now quite free from pain; breathing nearly normal; has ceased to support herself with hands on knees.

April, 1879. Now appears to be quite well, but plaster still worn; attends school regularly; has grown much taller.

HARRY SPERRIT, æt. 7, admitted *April 23*, 1878. Pott's disease. Antero-posterior curvature at last cervical and first dorsal vertebræ; quite unable to stand; screams with pain upon being moved; continually supports head by resting chin upon his hand. During first week in *May* plaster-of-Paris bandage applied with jnymast.

May 14th. Can now walk about free from pain.

April, 1879. Has had plaster removed and jurymast readjusted from time to time; has grown in a very marked manner, and now appears to be quite well, but still wears jurymast, his mother not liking him to part with such a good friend.

REPORT

ON

AMERICAN MEDICAL NECROLOGY.

REPORT

AMERICAN MEDICAL ASSOCIATION

REPORT ON AMERICAN MEDICAL NECROLOGY, 1879.

By J. M. TONER, M.D.,

CHAIRMAN OF COMMITTEE.

IN making up the report on Necrology for 1879, I wish to acknowledge my very great indebtedness to those members of the Committee from the several States who have interested themselves in the discharge of the duty assigned to them by the Association. Their contributions are credited to them. It is to be regretted, however, that from some of the States no records of the deaths of even some of our most eminent members have been furnished. Why is this? Ought not defects of this nature to be corrected in future? The purpose of having on this Committee a member from each State is, I presume, that such member can and should report annually the deaths, with brief biographical sketches, of all worthy physicians of his State who have been honored with membership in this body. I trust that future reports will exhibit greater zeal on the part of members, and thereby secure greater completeness in this direction. The biographical sketches in the Report for 1878, unlike its predecessors, are arranged in alphabetical order, and not by States.

A Supplement to the regular Report contains as complete a list, with brief sketches of the lives, of the physicians who died of yellow fever in 1878 as could be collected.

J. M. T.

ARNOLD, THOMAS ALLEN, M.D., died of diphtheria at his home in Columbia, Mo., December 5th, 1878, aged thirty-seven years. He was a graduate of the State University, and took his professional degree at the St. Louis Medical College in 1869. After serving a term as Assistant Physician at the St. Louis City Hospital, he established himself in practice at Columbia, where he continued in the ardent prosecution of his profession until his untimely death. His life was sacrificed by extreme zeal in the

discharge of duty: he had performed tracheotomy on a patient suffering with diphtheria; the tube becoming clogged, he impulsively sucked upon it to clean it out; virus thus gained access to his system, and in two weeks proved fatal.

Dr. Arnold was an active member of the Medical Society of Boone County, Mo., and of the Missouri State Medical Association, and became a member of the American Medical Association in 1873.

His local Society passed appropriate and eulogistic resolutions as a tribute of respect to the memory of the deceased.

A. J. STEELE, M.D.

ATLEE, WASHINGTON LEMUEL, M.D., was born at Lancaster, Pa., February 22, 1808; died at his residence in the city of Philadelphia September 9, 1878. "He was a descendant of an old English family, many members of which reached distinction very early in the history of England. William Atlee, of Ford Hooke House, England, married against the wishes of his family Jane Alcock, a cousin of William Pitt, and he shortly after obtained a position as secretary to Lord Howe. He came with Howe to America, landing in Philadelphia in July, 1734." His son, the Hon. William Augustus Atlee, was an active Whig during the Revolutionary war, and was one of the judges of the Supreme Court of Pennsylvania.

He left several children, amongst whom was William Pitt Atlee, Esq., a lawyer, who married Miss Light, the daughter of Major John Light, an officer in the Revolutionary army. They had six children, of whom the subject of this memoir was the youngest. When he had reached the age of seven years his father died, leaving him under the care of his grandparents. While with them he continued at school, pursuing the ordinary English studies until he was fourteen years old, when, contrary to his own wishes, he was placed in a drygoods store. After remaining in this business for fifteen months he determined to leave it and study medicine. He chose his brother, Dr. John Light Atlee, as his preceptor, who made him a member of his family and directed him in his studies.

Thus encouraged, he worked with ardor, and with the aid of tutors supplied the deficiency of an early classical training, studying at the same time French, German, philosophy, and the natural sciences. He entered the Jefferson Medical College in

the winter of 1826-7, where his industry and talents attracted the attention of Dr. George McClellan, the Professor of Surgery, who invited him to become his private pupil.

Stimulated by the example and guided by the counsels of this great teacher, the efforts of young Atlee were redoubled, and on his return to Lancaster he at once engaged in practice amongst the poor, almost living in the Lancaster County Hospital. His efforts were so successful, and he became so popular, that before he received his degree he had attended forty cases of obstetrics.

His connection with the hospital gave him abundant opportunity to study practical anatomy, of which he was very fond; and much of his time was employed in dissection. Nor did these engagements fully occupy his time, for, "during the summer of 1827-8, he actively pursued the study of practical botany, and was a correspondent of Dr. William P. C. Barton, then Professor of Materia Medica and Botany in the Jefferson Medical College. He collected about four hundred specimens of Lancaster County plants into an herbarium, accompanied with a written description of each plant, which collection he subsequently presented to the Linnæan Society of Pennsylvania College at Gettysburg, Pa." He attended full courses of lectures at the Jefferson Medical College, and graduated in the spring of 1829. His thesis was on "Parotitis Gangrenosa," a title of his own, and a subject furnished in his own experience. Soon after graduation he located in Mount Joy, a small village in his native county, twelve miles from Lancaster. While here he originated a temperance society and a lyceum, delivered a lecture on temperance which was published, also a lecture on the great display of falling stars in November, 1833, a course of lectures on botany, and read several miscellaneous papers before the lyceum.

Dr. Atlee was married, April 15, 1830, to Miss Ann Eliza Hoff, daughter of John Hoff, of Lancaster. The issue of this marriage was ten children, the youngest having been born in the fall of 1844. Six of them survive: Kate, wife of David Burpee, M.D.; Mary, wife of Thomas M. Drysdale, M.D.; Eliza, wife of John Sheaff, Esq.; Margaret H. Atlee, Washington L. Atlee, M.D., and Charles L. Atlee, Esq.

In the autumn of 1834 Dr. Atlee removed to Lancaster, his native place. He was soon elected to the staff of Lancaster County Hospital, and in 1837 was appointed treasurer to the Commissioners of Lancaster County. For several successive

years he delivered regular courses of lectures on chemistry to private classes, and a public course before the Mechanics' Institute of Lancaster. He was also active in originating an association called "The Lancaster Conservatory of Arts and Sciences," before which he gave a course of lectures on hygiene, besides other scientific and miscellaneous lectures. At the time of the execution of the murderer Moselman, he made out a programme of experiments to be performed upon his body, which was carried out with eminent success. He also aided actively in establishing the Lancaster County Medical Society. Having received an invitation in 1844 to fill the chair of Medical Chemistry in the Medical Department of Pennsylvania College at Philadelphia, he made a temporary arrangement to lecture during the ensuing session. Afterwards accepting the position permanently, he removed his family to Philadelphia in the fall of 1845, and continued his connection with the college until the spring of 1852. During this period the practice of his profession grew so much upon him, that he found the joint labors too great. He therefore resigned his professorship, and has ever since devoted himself actively and solely to the practice of gynæcological surgery. In 1853, at a meeting of the American Medical Association held in the city of New York, he competed for one of the prizes. Twelve essays were presented to the committee on volunteer communications contesting for this honor, and his paper was one of two to which it was awarded.

He assisted in the organization of the Philadelphia County Medical Society, of the Medical Society of the State of Pennsylvania, and of the American Medical Association, and retained his membership in each. He was always a general practitioner, but in late years was forced to relinquish obstetrics, because his time was fully occupied in the treatment of diseases of females.

"While still in Lancaster, he was known as a skilful and courageous operator, and the publication of some of his cases in the *American Journal of the Medical Sciences* had also introduced him favorably to the medical public; but, before leaving that city, he performed and published two operations which fixed the eye of the profession upon him as a dangerous innovator—as a man who had been performing a hazardous operation, which, though previously undertaken, had proved so unsuccessful that it had been condemned, even by some of those who had practised it—ovariotomy.

“Besides, there was a cloud of doubt and distrust which hung over the early history of the operation which had not then been cleared away; and, further, it had been attempted but by few men of note, most of whom, after a brief trial, had abandoned it, both on account of its fatality, and the difficulty attending the diagnosis. In fact, ovariectomy was an operation universally denounced, and he must be a brave and determined man who should dare attempt to establish its legitimacy. This he proposed to do, his early experience having led him to believe it a justifiable measure. He has shown how carefully and conscientiously he prepared himself for the difficult task before him, and has also shown how great was the odium brought upon him by the performance of this operation in his address as president of the Philadelphia County Medical Society, entitled ‘A Retrospect of the Struggles and Triumphs of Ovariectomy in Philadelphia.’ In this interesting history, he says: ‘I found, upon moving to Philadelphia, that ovariectomy was everywhere decried. It was denounced by the general profession, in the medical societies, in all the medical colleges, and even discouraged by the majority of my own colleagues. I was misrepresented before the medical public, and was pointed at as a dangerous man—even a murderer. The opposition went so far, that a celebrated professor—a popular teacher and captivating writer—in his published lectures, invoked the law to arrest me in the performance of this operation.’

“This address shows clearly the status of the operation, and the unmerited opprobrium visited upon those who had the temerity to perform it at that early day. But a reward was in store for a struggle of years against professional prejudice; for he became so identified in the public mind with ovariectomy that, after its success was established, his services were in demand on every side.

“From Maine to California, from north and south—in fact, from every State and Territory—continually arrived letters urging him to come and operate. He visited, for this purpose, one of the New England and two of the extreme southern States within the same week. These distant cases made it necessary for him to relinquish family practice; but when at home he was kept busy with consultations, and his offices were filled by patients—many of them coming from long distances—to seek relief at his hands. His success was great, and was the result,

not only of consummate skill and care as an operator, but of the wonderful diagnostic tact he never failed to manifest. As an operator, he was cool, and fully prepared for all emergencies. He avoided a needless array, and, although having a full reserve of instruments, used but few. His friend, Prof. Gross, in speaking of this, says: 'With the knife he was, in his particular line, *facile princeps*. He appreciates the aphorism of Desault, that simplicity is the perfection of an operation. He rarely used more than one scalpel, one bistoury, one pair of forceps, one pair of scissors, and one needle. He had a just horror of display. The duties having been duly assigned to his assistants, everything proceeded as silently as possible, and with the regularity of clockwork. Always self-possessed, his eye never quailed, his hand never trembled.' " One of his biographers, Dr. Drysdale, says:—

"He was in the habit of giving his diagnosis to the medical gentlemen present before he commenced an operation, and if he had any doubt, he told it plainly, and gave his reason for it. This, of course, afforded all present an opportunity of judging of the correctness of his opinions, and in a close association with him of thirty years, I can recall but few errors. It is remarkable that with so little leisure he managed to perform so much clerical labor, for he carried on an extensive correspondence, frequently contributing to the journals, wrote an octavo volume on ovarian tumors, besides essays on subjects connected with gynecology, and kept full notes of all important cases, recording them the day they occurred, nor would he sleep until all intended work of this kind had been accomplished.

"Although his time was so fully occupied, he did not fail to keep himself perfectly familiar with the medical literature of the day and with the improvements in medicine, and none was more ready than he to recognize and adopt them. He also added to the success of his operations by planning new methods of procedure in particular cases, among which may be mentioned the use of the *écraseur* to divide the pedicle in ovariectomy which he was the first to employ, June 17, 1857. He also practised enucleation in the same operation as early as July 25, 1850. Many of the instruments he used were invented or improved by himself, as, for instance, the well-known clamp which bears his name.

"He was the first to clearly indicate the importance of tapping as a means of diagnosis in obscure cases of abdominal dropsy,

and also the first to point out the true value of the removed fluids for the same purpose, particularly to differentiate cysts of the broad ligament and fibro-cystic tumors of the uterus from ovarian tumors. It is well known to surgeons that in ovariectomy the thickened and opaque peritoneum has been frequently mistaken for the cyst, and separated from the muscles for some distance before the error has been discovered. This mistake, besides embarrassing the operator, has added to the risk of the operation, and no method of avoiding it was known until Dr. Atlee pointed out a safe and valuable guide by which such an error was made impossible. This test is the passing up of the hand or of a sound to the umbilicus, when, if it be peritoneum, the hand is arrested, but if it be cyst, it passes easily. There was a remarkable originality in him, which was frequently displayed in his operations. It was manifested in his case of vaginal ovariectomy, which antedates all others.

“But perhaps this was more strikingly seen in his operation for the removal of uterine fibroids. His first case of this kind occurred in 1845. Its complete success fully disproved ‘the position hitherto esteemed as an axiom by surgeons of authority, that polypus of the uterus cannot be subjected to operative measures until it has escaped from the uterine cavity.’ The numerous cases following this he embodied in a paper which was one of twelve essays presented to compete for the prize at the meeting of the American Medical Association held in the city of New York, in 1853. His paper was one of the two to which the prize was awarded. It was entitled ‘The Surgical Treatment of Certain Fibrous Tumors of the Uterus heretofore considered beyond the Resources of Art.’ A synopsis of one of the cases contained in this essay was previously embraced in the Report on Surgery in 1850 by Prof. Mussey, who says: ‘Of all the achievements of modern surgery, we meet with none more striking or extraordinary than the operations performed by Prof. Atlee for the removal of intra-uterine fibrous tumors.’

“Prof. Pallen, in his prize essay presented to the American Medical Association in 1869, says: ‘In 1853 Dr. Washington L. Atlee startled the profession by his method of heroically attacking uterine tumors with the knife. His successes were numerous, and the ingenuity of his devices is deserving of the highest commendation.’ And Dr. J. Marion Sims, in the *New York Medical Journal*, April, 1874, writes: ‘The name of

Atlee stands without a rival in connection with uterine fibroids. His operations were so heroic that no man has as yet dared to imitate him. A generation has passed since he gave to the world his valuable essay on the surgical treatment of fibrous tumors of the uterus; but it is only within the last five or six years that the profession have come to appreciate the great truths which he labored to establish. Meadows, of London, and Thomas, of New York, have each achieved splendid results in this direction, and made valuable contributions to our literature. A few isolated cases of fibroid enucleation have been published by others, and this is about all that we can boast of since Atlee first led the way for us.'

"The last paper which he wrote on this subject was entitled 'The Treatment of Fibroid Tumors of the Uterus.' It was read before the International Medical Congress, September, 1876. In it he gave the results of his great experience in the treatment of these growths, both by medical and surgical means. This elaborate paper evinced great originality, and was warmly applauded by the section before which it was read, composed of some of the most distinguished men in this branch of medical science.

"With all these engrossing labors he never ceased to feel the warmest interest in the general welfare of the profession. He took an active part in the organization of the Philadelphia County Medical Society, of the Medical Society of the State of Pennsylvania, and of the American Medical Association. He was also one of the founders of the American Gynæcological Society. In all these bodies he retained his membership until his death. Of the Philadelphia County Medical Society he was president in 1874, and president of the State Medical Society of Pennsylvania in 1875. In the same year he was vice-president of the American Medical Association, and first vice-president of the American Gynæcological Society in 1876-77.

"At the meetings of these bodies 'he was known as a brilliant extempore speaker and an able debater, his influence being always exerted in favor of a higher medical education and a broad and liberal construction of the rights and duties of medical life.' In his long connection with these societies, he allowed nothing but the most urgent engagements or sickness to interfere with his attendance on their meetings. That this interest was earnest and sincere was well seen in the last journey which

he took, which was to attend the meeting of the State Society at Pittsburgh in May, 1878. He was then so feeble as to require support in walking, and so emaciated that every moment was painful to him, and yet he endured the trying journey merely to meet them once more.

“He was an affectionate father, a firm and warm friend, and a thoroughly conscientious, honest, and truthful man. In person, he was above the ordinary stature, erect and commanding in his carriage, his face benevolent, his manner courteous and dignified, and although kind, forbidding familiarity. In the sick room, he was uniformly cheerful, and as tender and sympathetic as a woman. His very appearance inspired confidence. His movements were quick and decided, indicative of his character.

“About six months before his death he was attacked with rheumatism, which added greatly to his distress, but no marked local symptoms manifested themselves until February, 1878, when a small hard mass was found projecting below the border of the ribs on the left side. This increased rapidly, and by June extended from the nipple to the anterior superior spinous process of the ilium. It consisted of a comparatively soft mass above, terminating below in hard nodules. It was supposed to be a malignant disease of the spleen. The liver was also greatly enlarged, its lower border touching the anterior superior spinous process of the ilium on the right side. In the latter part of June, the lower slowly diminished in size, and continued to contract until nothing could be felt of it except the hard nodules just below the ribs.

“In the autopsy made the day after death, the spleen was found enlarged to about twice its usual size, but was healthy in structure. It was located more anteriorly than normal, and just under it was a large tumor, which a careful examination proved to be the left kidney. It reached from the diaphragm above to the promontory of the sacrum below, and was firmly adherent to the parts beneath it, incorporating the aorta and other vessels in its mass. Its estimated weight was between two and three pounds. It proved to be a medullary cancer of the left kidney, its upper border being hard, while the remainder of the mass was cerebriform.

“In its early stage it was evidently pressed on the vessels of the spleen and liver, producing congestion of these organs, which in the last two months was relieved by the softening of

the mass. The spleen being thus much enlarged and covering the diseased kidney like a cushion, led us into the error of supposing it the organ at fault. The urine was carefully and frequently examined in all stages of the disease, but nothing abnormal was ever found in it. The right kidney was rather larger than normal, and contained in its aortical substance a number of cysts, some of them as large as a nutmeg, and filled with a yellowish fluid.

"The heart contained in the right ventricle, and firmly attached to its right wall and to the columnæ carneæ, a growth of a light fawn color and firm consistence, about the size of a large English walnut. It was situated just below the tricuspid valve. The mitral valves were thickened, but the aortic valves were healthy. The disease having been recognized in February, all hope of cure was abandoned, but he persisted in attending to his practice, and continued to operate until three months before his death. His last operation was performed at Sligo, Pa., May 30, 1878. This was his 387th case of ovariectomy. Although he continued to attend to office patients for some time after this, his suffering and weakness soon confined him to his room, and compelled him to divide his time between a reclining chair and his bed. He settled all his worldly affairs, yet he did not lose his interest in his profession, but continued to read the medical journals and see his friends, making but little complaint, and patiently awaited the final summons. The waste of body did not impair his intellectual faculties, for his mind remained clear until the last. Although he knew that his end was rapidly approaching, he showed no fear of death, but welcomed it, not only as a relief, but as a means of realizing his hopes as a Christian."

The following is as complete a list of Dr. Atlee's publications as I am able to furnish:—

"On the Ergot of Wheat," published in *Columbia Spy*, 1830.

"On Certain Cavities in Quartz," *American Journal of Science and Arts*, 1837.

"Case of Hydrophobia," *American Medical Intelligencer*, 1839; also in the *Transactions of American Medical Association*, 1856; also in pamphlet form, with comments on Stoy's cure. See pamphlet.

"Case of Smallpox, contagion apparently conveyed by letter." *American Journal of the Medical Sciences*, 1840.

"Report on a Series of Experiments (instituted by Washington L. Atlee, M.D.), made by the Medical Faculty of Lancaster, Pa., on the body of Henry

Cobler Moselman, executed in the jail yard of Lancaster County, Pa., on the 20th of December, 1839."

"Meteorological Report" for 1839, 1840, 1841, 1842, 1843.

"A Review of Sherwood's Theory of Terrestrial Magnetism." Public Ledger, of Philadelphia, 1841.

"A Case of Congenital Tumor composed of many Cysts." American Journal of the Medical Sciences, 1843.

"A Case of Molluscum associated with Fibro-cellular encysted Tumor and Encephaloid Disease." American Journal of the Medical Sciences, 1843.

"A Case of Ovariectomy." American Journal of the Medical Sciences, 1844.

"Two Cases of Perineal operation on the Urethra; in one case to relieve traumatic stricture; and in the other to restore the cystic portion of the canal, which had been completely obliterated." *Ibid.*, 1844.

"A Case of Successful Extirpation of a Fibroid Tumor of the Uterus by the large peritoneal section." *Ibid.*, 1845.

"A tabular synopsis of one hundred and one operations of Ovariectomy." *Ibid.*, 1845

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"A course of Lectures on Botany," at Mount Joy, 1831.

"Two Lectures on Falling Stars of 1833," at Mount Joy.

"Three courses of Lectures on Chemistry," to private classes at Lancaster, 1835, 1836, 1837.

"A course of Lectures on Chemistry," before the Mechanics' Institute of Lancaster, 1837.

"A Lecture on Aerolites," before the Lyceum of the State of Pennsylvania in the session at Lancaster.

"A course of Lectures on Hygiene," before the Lancaster Conservatory of Arts and Sciences, Lancaster, 1840.

"An experimental course of Lectures on the materials used for Illumination," before the citizens of Lancaster about forming the Lancaster City Gas Company, 1840.

"Eight courses of Lectures on Medical Chemistry," in Medical Department of Pennsylvania College, Philadelphia, from 1844-45 to 1851-52 inclusive.

"A Lecture on Placenta Prævia," before Philadelphia County Medical Society, 1858.

"Three Lectures on the Diagnosis of Ovarian Tumor," before the Philadelphia County Medical Society, 1859, 1860, 1861.

The sources from which the data used in this sketch are derived are Dr. Thomas M. Drysdale's "Biography, Physicians and Surgeons of the United States," and J. M. Toner's "History of the Rocky Mountain Medical Association."

J. M. T.

BEECH, JOHN HENRY, M.D., was born September 24, 1819, at Gaines, Orleans County, N. Y.; died of pneumonia at his residence in Coldwater, Michigan, October 17, 1878. His father,

Dr. Jesse Beech, long resided and practised his profession in Orleans County. His mother's maiden name was Susan Brown. The subject of this sketch studied at Gaines Academy, and afterwards was under the instruction of Hiram E. Pinckney. Dr. Beech graduated in medicine at Albany Medical College April, 1841, commencing practice in Gaines the same year. In 1850 he removed to Coldwater, Branch County, Michigan, where he continued in active general practice until his death, excepting the time he was absent in the army as surgeon of the 24th regiment Michigan Infantry. Since 1865 he had practised surgery and gynæcology as specialties. He was the author of numerous short articles for medical journals, and various addresses at college commencements and before medical societies. In his early professional life he was instrumental in resurrecting the Medical Society of Orleans County, N. Y., and after his settlement in Coldwater was active in reviving the Michigan State Medical Society, of which he was elected President in 1856. In 1854, 1855, and 1875 he was elected a Delegate from the Michigan State Medical Society to the American Medical Association. In 1870 he was elected Corresponding Member of the Detroit Academy of Medicine, and in 1872 Corresponding Member of the Gynæcological Society of Boston. In 1875 he was elected President of the Alumni Association of Albany Medical College. He was appointed Surgeon 24th regiment Michigan Infantry 1862. In 1865 he was elected a member of the American Public Health Association. He was one of the editors of the *Michigan Medical News*, published in Detroit. In 1866 he was elected Mayor of the city of Coldwater.

He was a prominent member of the Masonic Order, and of the Royal Arch Chapter.

He was President of the Board of Trustees of Coldwater Female Seminary, and member of City Board of Education; a liberal supporter of the Ladies' Library Association, of which he was made a life member; and an advocate for and contributor to the Michigan State School for Indigent Children.

The Doctor was liberal in his contributions, both by work and money, to all worthy public enterprises; he contributed largely towards erecting the Presbyterian Church of Coldwater, with which denomination he was in hearty sympathy, though not a member of the church. He was a firm supporter of the public

schools, and of other educational institutions, though he had no children to educate.

Dr. Beech was a democrat in politics, but not an active politician. He was not robust, though able to lead an active life, being light and rather delicate; of refined and elevated tastes; firm and unflinching in character, never wavering a moment from what he considered his duty; always ready to battle for the right, but always courteous and gentlemanly, and strong in his attachments to his friends.

Dr. Beech's last illness began with a chill October 11, 1878, followed by pleuritic pains and fever. On the 13th a careful examination discovered hepatization of lower and posterior portion of left lung. On the 14th he became delirious, and continued so till next morning; at all other times during his illness his mind was very clear. On the 15th the right lung became involved, and his disease progressed steadily to a fatal termination. He had had several attacks of pleurisy during the past twenty years, and thought this another when it began.

Dr. S. S. Cutter, his medical attendant, published a graphic account of his illness and autopsy Nov. 10, 1878, in *Michigan Medical News*, the No. for October 20 giving an excellent editorial obituary notice and biographical sketch; also a high eulogium of his professional attainments, his humanity and kindness of heart, his integrity, and devotion to duty in his army life, written by Dr. C. C. Yemans, formerly 2d lieutenant in the 24th Michigan Infantry, of which Dr. Beech was surgeon. Resolutions of respect were passed by the survivors of his old regiment; also by Detroit Academy of Medicine, Southern Michigan Medical Association, and Calhoun County Medical Society.

The remains of Dr. Beech were interred in Oak Grove Cemetery, Coldwater, with Masonic honors, a large number of his professional friends from various parts of the State attending his funeral.

The Doctor was three times married: in 1842, to Eliza Crownse, daughter of George and Catherine Becker Crownse; in January, 1861, to Mary Jane Perry; August 26, 1874, to Mrs. Sarah E. Skeets, daughter of William and Sarah Shippen Lewis, who survives him.

It is no disparagement to the profession of that portion of the State to say that no one of its many able members will be more missed than Dr. Beech.

" The data for the foregoing were received from the widow of Dr. Beech, his friend, Dr. S. S. Cutter, *Michigan Medical News*, and *Transactions Calhoun County Medical Society*.

W. F. BREAKEY, M.D.

BOOTH, DAVID WINFIELD, M.D., was born in Vicksburg, Miss., July 17, 1840; died of yellow fever in that city Aug. 27, 1878. His parentage was of English and Irish extraction. The Doctor was educated at Hampden Sidney College, Va. His medical degree was obtained at the University of Louisiana in 1861. Shortly after this, he entered the confederate army in the capacity of an assistant surgeon, became regimental, then brigade, medical inspector, and staff surgeon.

At the close of the war he settled to practise at Vicksburg, Miss. He was a member of the American Medical Association since 1869, in which year he represented the Vicksburg Medical Society in that body. He was also a member of the Mississippi State Medical Society. In 1865 he was chosen physician to the City Hospital at Vicksburg, when the hospital was turned over by the U. S. government to the city authorities. Dr. Booth remained in charge, giving much satisfaction, until press of other business caused him to resign, in 1869. In 1875 he leased the same building, and opened it as what is now known as the "Hill City Infirmary," which he conducted, we believe, up to the time of his death. He contributed a number of papers to the Mississippi State Medical Society, which are published in its Transactions. The Transactions for the year 1873 contain two papers from his pen.

In 1866 Dr. Booth was married to Belle, daughter of David Woodruff, Esq., of Tuscaloosa, Ala., who with four children survives.

Data chiefly from "Physicians and Surgeons of the U. S.," and from advance sheets of "Minutes of Mississippi State Medical Society."

J. M. T.

BROWN, THOMAS RICHARDSON, M.D., was born in Kent County, Md., April 6, 1846; died at his residence, in the city of Baltimore, January 26, 1879. He was the son of Thomas Richardson Brown, a farmer of Kent County, Md. His mother, Mary Elizabeth, daughter of Thomas C. Hynson. The subject of this sketch

received a good academic education, partly at the University of Maryland School of Letters. On leaving school he was employed for a short time in the office of the British consul in the city of Baltimore. In 1864 he embarked for a cruise upon a bark laden with petroleum. After they were out a short time, the vessel unfortunately caught fire, and the crew was compelled to take to boats, and, after some days, were rescued by an Italian bark, were well cared for, and landed safely at New York.

Immediately on his return to Baltimore he began the study of medicine, in 1864, with Prof. N. R. Smith; attended lectures at the University of Maryland, and graduated M.D. from that institution in 1866. He then repaired to Philadelphia, and presented himself for admission to the medical corps of the U. S. Navy. He passed a satisfactory examination, and was commissioned in April of that year, and ordered to report to the U. S. receiving ship *Alleghany*, then lying at Baltimore. On December of this year he was united in marriage to Miss H. R., youngest daughter of John K. Carrington, of Baltimore.

In the spring of 1867 he was ordered to the flag ship *Guerriere*, Rear Admiral Davis commanding, South Atlantic squadron. During his cruise on the South American coast he was for a time transferred to the *Pawnee*, then in the harbor of Bahia, where he rendered valuable services during a severe epidemic of smallpox prevailing there. On his return to the United States, he was for a time assigned to hospital and other shore duty. In July, 1870, he resigned his position in the navy, and opened an office on the corner of Lowell and Park Streets, Baltimore. He at first engaged in general practice, but soon manifested an aptness for surgery, particularly uterine. In 1873 he was elected to the chair of Clinical and Operative Surgery in the College of Physicians and Surgeons of Baltimore. Subsequently he largely specialized his practice to genito-urinary surgery, and was foremost among the surgeons of our country in this department. He contributed two papers of much merit on this subject, one entitled "Urethral Stricture," and the other "Urethral Fever." His other writings on surgical topics attest his familiarity with his subject. In 1876 he was appointed by Gov. Carroll a member of the board of managers of Spring Grove Asylum for the Insane. In this position, as in all others, he distinguished himself by his zeal and efficiency.

He was a member of the American Medical Association, the

Medical and Chirurgical Faculty of Maryland, the Baltimore Medical and Surgical Society, and president of it at the time of his death, and the American Dermatological Association. As a lecturer and speaker, Dr. Brown was gifted, captivating, holding the attention of his classes and hearers to the close. He was a man of warm sympathies, and popular with his *confrères* and patients.

Although not physically strong, his death was hastened, probably, by a slight scratch upon one of his fingers by a spicula of necrosed bone, in excising a diseased shoulder-joint. From this chills, followed by slight septicæmia, and heart and lung complications, which terminated in death in five weeks. The local medical organizations to which he belonged passed appropriate resolutions of respect, and attended his funeral in a body.

He leaves a wife and five children. His remains were interred in Greenmount Cemetery. An obituary notice of the Doctor was published in the March number, 1879, of the *Maryland Medical Journal*.

Data from J. H. Hartman, M.D.

J. M. T.

CAMPBELL, ARCHIBALD B., was born at Philadelphia, Pennsylvania, April 18, 1821; died of softening of the brain at Chicago, Illinois, September 1, 1878. The Doctor graduated in Arts at Amherst College, Massachusetts, in 1840, and subsequently in medicine at Jefferson College, Philadelphia.

Dr. Campbell served during the Mexican war as assistant surgeon to the regiment of volunteers of which General Joseph E. Johnston was lieutenant-colonel, and, after that regiment was disbanded, was appointed an acting assistant surgeon, and stationed for several years at Fort Mifflin, Pennsylvania. In 1853 he was elected physician in chief to the Philadelphia Hospital, Blockley (also known as the Blockley Almshouse), a position which he held till 1857, when he went temporarily to Russia as surgeon of the "American Submarine Exploring Company," and after his return commenced the practice of medicine in Philadelphia.

April 30, 1861, Dr. Campbell was appointed surgeon of the 20th Pennsylvania volunteers, and September 2d, surgeon of volunteers. With this rank he served honorably during the war of the rebellion, and was mustered out of service November 28,

1865. He then went to Arizona in connection with a mining enterprise, and this proving unsuccessful he resolved to return to the military service.

Dr. Campbell was appointed an assistant surgeon in the army October 9, 1867. He served at Fort Randall, Dakota Territory, till July, 1868; at Camp Cook, Montana Territory, till November, 1869; Fort Benton, Montana Territory, to November, 1870; Fort Ellis, Montana Territory, till May, 1872, when he received a leave for six months, and afterwards was placed on temporary duty at Chicago, Illinois, till December, 1873. He was then ordered to Texas, and served at Fort Clark till April, 1874, and at Ringgold Barracks till May, 1878, when he received leave of absence, and was still on leave at the time of his death.

J. J. WOODWARD, *Surgeon, U. S. A.*

COCKRILL, JAMES JACKSON, M.D., was born in the city of Baltimore, Maryland, March 28, 1815; died of disease of the heart at his residence in that city July 13, 1878. He was the son of Thomas Cockrill, Esq., an extensive iron manufacturer of Baltimore. His mother was Rebecca, daughter of John Ward Veazy, of Maryland. His father was first lieutenant in Captain Matthew McLaughlin's artillery company attached to the third brigade of Maryland militia, his commission bearing date Feb. 12, 1812. Dr. Cockrill received his academical education at St. Mary's College, Baltimore, and graduated in medicine at the University of Maryland in 1837. Immediately after receiving his degree he opened an office in the city of Baltimore, Maryland. He gradually acquired a good general practice, including surgery.

From the first he identified himself with the various medical organizations of the city of Baltimore and State of Maryland. In 1842 he became a member of the Medico-Chirurgical Society of Maryland, holding at different times most of the various offices within its gift. For a number of years he was a member of the Board of Examiners of that Society. He was also a member of the American Medical Association, attending meetings with regularity from 1866 to 1870.

He was united in marriage to Mary E. Ford, daughter of Joseph and Eveline Shaw. They had six children, four sons and two daughters. In 1863 Dr. Cockrill was commissioned by Governor Bradford as medical examiner to the draft office in Baltimore. Subsequently he was with two other gentlemen sent

to Frederick City to take charge of the office for drafting recruits in Frederick County. In 1864 and 1865 he had charge of Hicks Military Hospital, and was afterwards examining surgeon for the discharge of disabled soldiers.

Data furnished by Dr. J. H. Hartman.

J. M. T.

COMPTON, WILLIAM McCORKLE, M.D., of Jackson, Miss., was born in Madisonville, Hopkins County, Ky., August 4, 1833; died of yellow fever at Holly Springs, Miss., Oct. 24, 1878. His academical education was received at an academy in Alabama. Selecting medicine as a profession, he qualified himself for attending lectures, and passed one winter at the University of Louisville, Ky. His second course was at the Jefferson Medical College of Philadelphia, where he graduated M.D. in 1854.

Returning South, he commenced practice in Marshall County, Miss., where he remained and practised until the war between the States demanded the services of all classes of citizens. He was a member of the legislature in 1861, and a delegate to the Constitutional Convention of Mississippi in 1865, and again in 1868.

During the progress of the war he served as surgeon in the Confederate army. In 1870 he was appointed superintendent of the State Lunatic Asylum at Jackson, to which place he removed, and conducted the institution to the satisfaction of the visitors and the State authorities. He was a general practitioner as well as a specialist.

He was a man of large frame, and active, inquiring brain; of even, cheerful temperament, and of an analytical, logical mind, well calculated to administer to the wants and comforts of the insane.

He was a member of the Mississippi State Medical Society, the American Medical Association, the Mississippi State Board of Health, and of the American Association of Superintendents of Insane Asylums. His contributions to medical literature are not numerous, but they show care, reflection, and ability. His "Essay on Medical Experts," in the Transactions of the Mississippi Medical Association for 1873, is deserving of special perusal.

In 1856 he was united in marriage to D. Brittania, daughter

of Charles Yarborough, Esq., of Marshall County, Miss. After her death he married, in 1863, Ernestine, daughter of W. W. Goodwin, Esq., of Macon, Miss. His wife and all his children fell victims to the terrible disease.

Data chiefly from "Physicians and Surgeons of the United States."

J. M. T.

EASLEY, TANDY EDWARD, M.D., of Little Rock, Pulaski County, Arkansas, was born in Perry County, Alabama, October 29, 1842; died of yellow fever, Memphis, Tennessee, September 30, 1878. His father, Dr. T. W. Easley, was a practising physician in that place. His mother, Miss Jane Kennedy, a young lady of most excellent character and worth. Miss Kennedy was descended from an old and highly esteemed family, three of whose brothers became physicians of distinction. One of them travelled in Europe several years, and is mentioned by Madam La Vert in her European peregrinations.

When young Edward was quite a small boy, his father removed to Mechanicsburg, Yazoo County, Mississippi, where he continued to practise his profession in the surrounding country until his death in 1852.

Dr. T. W. Easley's family were consumptive, the disease being hereditary, and to this destroyer he early fell a victim. He died possessed of a small plantation and some few slaves; the former was lost through a defective title, and the latter through the fortunes of war. His widow sent Edward, her only son and living child, to Sharon School in Madison, an adjoining county, where he remained until he graduated. This circumstance is represented to have occurred some time after the commencement of hostilities between the North and South. As young Edward had early espoused the cause of his native State, he immediately, upon closing his career at school, volunteered as a private in a Mississippi regiment, was taken prisoner and sent to Rock Island, Illinois, where he remained until the end of the war.

Upon his return home he served as a clerk in a country store at Mechanicsburg, Mississippi, for some months. He then went to Satartia, some twelve miles distant, where he continued engaged as a clerk in a mixed store that kept a general stock of staple drugs and medicines. Here he commenced the study of medicine under the private instruction of Dr. G. F. Mellen, and at the

same time attended to the sale of drugs and medicines in this branch of the general store.

He remained here until he was thoroughly prepared to attend medical lectures, and in the mean time had saved sufficient means to enable him to meet his expenses while doing so. He selected the Louisville Medical College, where he remained until he graduated in the spring of 1874. From Louisville, Dr. Easley proceeded immediately upon the receipt of his diploma to Detroit, Michigan, and attended the June session of the American Medical Association of that year. On returning home, Dr. Easley commenced the practice of medicine at Lake Station, Mississippi. He remained here only a short time, when he went to Texas and located at Dallas, but removed to Little Rock, Ark., in the year 1875, where he entered upon a general practice.

In the spring of this year, while a resident of Dallas, Texas, Dr. Easley was elected Secretary of the Surgical Section of the American Medical Association, a very distinguished honor for so young a practitioner. He also this year became the recipient of several thousand dollars, a direct legacy from his grandfather Kennedy's estate.

Dr. Easley's mother remained a widow many years, but finally married again, and died shortly after, without leaving any issue by her second marriage.

Dr. Easley served in the capacity of Secretary of the Surgical Section of the American Medical Association at the June session of this body in Philadelphia, 1876. In the spring of 1877, Dr. Easley became a member of the College of Physicians and Surgeons of Little Rock, and of the State Medical Society.

At Chicago, Dr. Easley was again elected Secretary of the Surgical Section of the American Medical Association, and served in this capacity at the Buffalo session of this Association in June, 1878.

Thus Dr. Easley became again honored, and very deservedly so, as his services had been previously appreciated by the members of this national body.

When the yellow fever became epidemic in Memphis, Dr. Easley tendered his professional services to the Howard Association of Memphis through the Howard Association of Little Rock, and was accepted. He immediately repaired to the plague-stricken city, and was assigned to duty at the city hospital under the control of Dr. Thornton. His labors here can best

be understood by reading a letter from his own pen, directed to Dr. P. O. Hooper, of this city. This letter never came to hand until the quarantine at Little Rock had been raised, long after poor Easley had passed the portals of this life.

MEMPHIS, Tennessee, September 16, 1878.

TO DR. P. O. HOOPER. DEAR DOCTOR: Since the first instant I have been busily engaged with the fever; have two large wards at the city hospital, one male and one female. Everybody knows and says the virulence and fatality of the disease is unequalled. Myself and Dr. Thornton, a noble and accomplished gentleman, are pressed to our full working capacity. The facts are worse than the newspaper accounts. For instance, 69 deaths reported yesterday. In truth there were over 100, five or six at this point unclassified, to my knowledge. This morning the press gave 92; there are over 100. They try to make the reports correct, but of necessity fail, as you can readily understand. When not working at the bedside of patients, we discuss the weather. I am sorry to say we have nothing new. We take pulse and temperature twice daily, watch, wait, work, am almost constantly in the wards, and yet with all the mortality is enormous. If I get through, we will have from this institution the largest thermometrical observations ever made. I have already taken over 150. I trust these will be of some value. I have, however, a message for your people. Everything connected with the epidemic here points to a *clear history of importation*. Tell your Health Board in spite of all opposition to be still vigilant, and so may God in his mercy spare you the scourge which so sorely afflicts this poor city!

Pardon my rough letter. I have few moments of my own. I think within ten days our mortality will begin to decline, not because the epidemic influence will be less, but because *material will be less*. That is, the filthy and worst parts of the city will begin to be depopulated. This is only my opinion, and of course may not be of value. God bless you, doctor, and may He care for you and yours, and your city. Don't fail to write. A letter is very pleasurable in the state of utter desolation here.

Very truly yours,

E. T. EASLEY.

Dr. Easley's death occurred less than two weeks after he wrote the letter.

Immediately upon his death being known, the College of Physicians and Surgeons of Little Rock were called together, October 1st, and the following are a few of the extracts of the announcement of his death, and resolutions then presented and adopted:—

The members of the College of Physicians and Surgeons of Little Rock have heard with profound sorrow of the death, in the morn of manhood, of Dr. Edward T. Easley, a member of this college, of the State Medical Society, and of the American Medical Association. When the yellow fever became epidemic at Memphis, Dr. Easley proffered his services, which were conditionally accepted, and about one month ago he was requested to repair to that plague-stricken city. In a spirit of courage, born of chivalric devotion to duty, he walked into this valley of the shadow of death, with the warning and almost certainty that he would be permitted to take no step backward. The surviving members of this body, desirous to do fitting honor to

his memory, and pay just tribute to his talents, professional ability, energy, and generosity, have

Resolved, That we express our high appreciation of the learning, perseverance, and skill of our late brother, which had enabled him to take an advanced position in his profession, and to merit distinction as a surgeon, seldom achieved by one of his age.

Resolved, That we cherish with pride and affection the remembrance of his lofty courage and knightly self-sacrifice, which led him to leave the security and ease of a well-assured position and comfortable home to brave the labor and danger and death of a struggle with the direst pestilence that ever visited our land.

Tributes of respect upon the life and character of Dr. Easley were likewise passed by the Howard Association of Little Rock, the Hot Springs Medical and Social Club, and the Alumni Association of the Louisville Medical College, before whom Dr. Easley had delivered the annual oration in the spring of 1878, and at the time of his death was its honored president.

Few physicians ever reached the distinction Dr. Easley gained at so early a period of professional life.

Dr. Easley was an assiduous student, a ready and facile writer, devoted to his profession, particularly the surgical branch.

He was the author of the following contributions to medical literature: "Circumstances modifying the Mortality of Amputations;" "Tortion for arresting Hemorrhage;" "Four Cases of Abscess of the Penis;" "Sanitary Condition of the Negro;" "Digitalis in Weak-heart of Continued Fever;" "Aspiration of the Bladder;" "Repair of Fractures, with Probabilities of Shortening;" "Quinine in Parturition;" "Septicæmia from Purulent Vaginal Discharges;" "Successful Abdominal Section for the Removal of Extra-Uterine Fœtus;" "Circumcision for the Relief of Reflex Irritation;" "Skin-Grafting;" "Physiological Antagonism in the Treatment of Fever;" "Tumors of the External Ear;" "Surgery of the Hand;" "Hæmo-Thorax;" "Absorption of the Vaginal Mucous Membrane;" and "The Study of Shock." The last was a posthumous paper of great merit.

Dr. Easley was a delegate to the International Medical Congress at Philadelphia in 1876. He never married, and was the last representative of his branch of the Easley family.

R. G. JENNINGS, M.D.

EDGAR, WM. S., M.D., was born in Philadelphia, Pa., in 1816; died at his residence in St. Louis, Mo., of disease of the heart,

Sept. 16, 1878. Parents were of Scotch descent, and belonged to the Society of Friends. He was educated at Marion College, Mo., commenced the study of medicine in the office of Drs. White and Tiffin in St. Louis, Mo., and graduated in medicine, in 1842, in the Medical Department of Kemper College (now the Missouri Medical College). Commenced practice, in 1842, at Collinsville, Ill., removing to St. Louis after a few years. In 1852 he took up his residence in Jacksonville, Ill., where he remained till the war broke out, when he was commissioned surgeon of the 32d Illinois regiment. At the close of the war he resumed his practice at Jacksonville. In 1869 he removed to St. Louis, which became his home until the time of his death.

He did a general practice; was editor of the *St. Louis Medical and Surgical Journal* from 1872 till 1878; was President of the Medical Editors' Association in 1875; was a member of the American, the Missouri, and the St. Louis Medical Societies.

He suffered for years from heart disease, of which he finally died. His habits were correct and regular. Was happily married and blessed with children. He stood well in the community as a man, a physician, and a citizen. He labored earnestly to elevate the standard of his profession, and strenuously advocated the certificate of State Examining Boards as qualification to practise medicine in the different commonwealths.

A post-mortem examination of Dr. Edgar showed enormous cardiac hypertrophy; the pericardium measured transversely *in situ* nine and a half inches; from above, downward, ten inches; circumference twenty inches; the pericardial sac contained four ounces of fluid; sixty ounces of blood were taken from the heart; the right auriculo-ventricular opening measured seven and a half inches in circumference; the left auriculo-ventricular opening admitted readily three fingers; the foramen ovale patulous, and large enough to admit four fingers, and measured seven and a half inches in circumference. This rare specimen was exhibited to, and gave rise to an interesting discussion at the meeting of, the St. Louis Medical Society. Doubtless from early youth he had suffered from organic heart disease.

A. J. STEELE, M.D.

EDWARDS, LEWIS A., Surgeon, was born at Washington, D. C., Sept. 29, 1823; died at Washington, D. C., Nov. 8, 1877, of progressive softening of the brain. He graduated in Arts at

Princeton College in 1842, and took his degree of Doctor of Medicine at the University of Pennsylvania in March, 1844. He was appointed an assistant surgeon in the army August 27, 1846; was promoted to the rank of surgeon Feb. 19, 1861; to be surgeon, with the rank of lieutenant-colonel, to fill an original vacancy, June 26, 1876.

Immediately after his appointment as assistant surgeon in the army, Dr. Edwards was ordered to join the army of invasion and occupation, and served with honor during the Mexican war. He was then stationed at Santa Fé, New Mexico, till September, 1850, at Fort Washington, Md., till July, 1852, and at Fort Towson, Ark., till May, 1854, when he was ordered to Washington and placed on duty in the Surgeon-General's Office. He remained in Washington, attached to the bureau or detailed as the attending surgeon for officers' families, till Aug., 1862, when he was ordered to take charge of the General Hospital at Portsmouth Grove, R. I. In Dec., 1863, he was sent to Wilmington, Del., as a member of the Army Retiring Board; returned to the Portsmouth Grove Hospital in May, 1864; and in December of the same year went back to Wilmington on the Retiring Board as before, till Jan., 1866. He was then stationed at Baltimore, Md., as medical officer of the recruiting station, till August, 1866, when he was appointed Chief Medical Officer of the Bureau of Refugees, Freedmen, and Abandoned Lands. In March, 1869, he was appointed Medical Director of the Department of Louisiana, and in April, 1870, Medical Director of the Department of Texas. In October, 1872, he was transferred to Madison Barracks, New York, as Post Surgeon, and in April, 1875, received sick leave, his health having now completely broken down. He made an effort to resume the duties of his post during the summer. His disease progressing again, received sick leave in October, 1875, and continued on leave till his death. Surgeon Edwards was appointed lieutenant-colonel, and colonel by brevet, to date from March 13, 1865, for faithful and meritorious services during the war of the Rebellion.

J. J. WOODWARD, *Surgeon, U. S. A.*

FITCH, WILLIAM MOSELY, M.D., was born in Columbia, S. C., Sept. 8, 1823; died, Charleston, S. C., Feb. 4, 1879. He was

the son of Dr. Augustus and Abigail (Putnam) Fitch. His grandparents were John Field Fitch and Lucy Mather.

The subject of this sketch received a good academical education, and graduated from the South Carolina College in 1842. His medical preceptor was Dr. H. H. Toland, author and teacher, now of San Francisco, Cal. He attended lectures at the Medical College of Charleston, where he graduated M.D. in 1845. His thesis had decided merit, and was on the "Sympathies of the System." Immediately after receiving his diploma, he settled to practise in Orangeburgh, S. C., but the following year he removed to Charleston, and formed a copartnership with Dr. J. W. Schmidt, which arrangement continued for four years, and was only limited by the death of the latter.

From this period, Dr. Fitch's practice was very large. He was laborious, careful, and attentive, and was one of the most successful general practitioners in the city.

Dr. Fitch was united in marriage, January 12, 1847, to Elizabeth Wilmot, daughter of Thomas and Cornelia Trout. They had children, Cornelia W., Augustus, and Wm. W. Fitch, who with their mother survive.

The Doctor was a man of fine physique, prepossessing in manners, regular in his habits, prompt, full of generosity, and forgiving to a fault.

His tastes were literary and refined, with a fondness for domestic associations and home attractions. He was a member of the Charleston Medical Society, the South Carolina Medical Association, the Widows' and Orphans' Relief Association, etc.

The funeral services of Dr. Fitch were conducted, at Grace Church, by the Revs. Moses A. Toomer and H. B. Judd. His remains were then conveyed to Magnolia Cemetery, and interred in the family vault. The following distinguished professional men and citizens acted as pall-bearers: L. Ogier, M.D., R. A. Kinloch, M.D., W. E. Huger, M.D., W. T. Wragg, M.D., J. S. Buist, M.D., J. C. Mitchell, M.D., Hon. W. D. Porter, and George H. Walter, Esq.

J. M. T.

GEDDINGS, ELI, M.D., was born in what was at the time Newberry District, S. C., now the county, in the year 1799; died at his residence in Charleston, S. C., October 9, 1878. His parents moved to Abbeville District when he was about fifteen years of

age. At the Abbeville Academy he acquired a pretty thorough knowledge of the Greek and Latin languages, and a training equal to that adopted by many of the colleges. Here, too, he formed the acquaintance of students who afterwards rose to eminence, and occupied the first positions under the government and in the professions.

From a lack of means to pursue a complete collegiate course, he commenced, in 1818, the study of medicine at Abbeville with Drs. Miller and Arnold, then the leading practitioners of that section. In July, 1820, he was licensed by the examining board of Charleston to practise medicine according to the then existing laws of the State. At the first succeeding anniversary of the Medical Society of South Carolina, as was the custom, he was re-examined before that body, and at the close a resolution was proposed by Prof. Dickson, and passed, complimenting him for his proficiency.

Dr. Geddings began practice at St. George Parish, where he remained but a short time. Returning to Abbeville in January, 1821, he formed a partnership with Dr. E. S. Davis, which was continued until November, when he went to Philadelphia to attend lectures at the University of Pennsylvania. In the spring of 1822 he returned to his labors in the Abbeville District, known as the "Calhoun Settlement." Here he continued his professional career until August, 1824, when he resolved to remove, the following month, to Charleston. The yellow fever was prevailing there at the time. He was attacked with the disease, but, through the careful attention of Dr. J. E. Holland, he recovered, and for whose kindness he continued to entertain through life the liveliest gratitude.

Dr. Geddings possessed an active trained brain that was ever on the alert for more and more knowledge. And although his practice in the Abbeville district was laborious, he familiarized himself with all of the late and most approved medical works bearing upon those diseases indigenous to southern climates.

The knowledge that a medical school was about to be organized in Charleston had, doubtless, something to do with his determination to take up his residence there. He attended the inauguration of the Medical College of South Carolina, and was proud of the honor of receiving the first degree at its first commencement in the spring of 1825. During the session he voluntarily, and most acceptably, discharged the duties of De-

monstrator of Anatomy, and to which office he was regularly elected at the termination of the course. After the close of the term the Doctor went to Europe to attend the hospitals of London and Paris. Spending a year in laborious and profitable study abroad, he returned to Charleston in May, 1827, and again engaged in practice, and for one year discharged the duties of Demonstrator. Resigning his position, he opened a private school of practical anatomy and surgery, which was eminently successful.

In 1831 he was invited to accept the chair of Anatomy and Physiology in the University of Maryland, which he did, and removed to Baltimore, Md. He filled the position with ability and increasing reputation until he resigned in 1837.

During his residence in Baltimore, he published, in 1833, the *Baltimore Medical and Surgical Journal*, quarterly, which, in 1834, was changed to a monthly, and known as the *North American Archives of Medical and Surgical Sciences*. This was a period of great mental activity with the Doctor, and besides lecturing and editing his journal he contributed several elaborate papers to the *American Journal of the Medical Sciences*. The labor performed by him for about fifteen years is almost incredible. Among other things, he studied the German and French languages, and wrote careful critical reviews of works issued from the press in those languages. In his school he acted as Demonstrator, aiding and directing students in dissections, for he had no assistants.

He delivered a full course of lectures on the Institutes and Practice of Medicine, all of which are written out in full, and delivered mainly from the manuscript. In this course was also included pathology, a comparatively new branch, and which he was among the earliest to teach in America. He was a fluent speaker, full of enthusiasm, possessed of an imaginative and an accurate memory, which was never at fault for a word or a name, holding the attention of his auditors from the opening to the close.

His course on regional and surgical anatomy was thorough, and fully up to the best demonstration in this department in any part of the world, comprising every practical point, including the adjustment of fractures, operations, bandages, etc.

He also delivered a course of clinical lectures at the Almshouse Hospital, in which he embodied the latest discoveries in physical diagnosis, including auscultation and percussion. He had, be-

sides these duties, a large private class, which he examined with care three times a week, and directed their studies.

Prof. Geddings was identified with the Medical College of South Carolina to the day of his death, from 1824 to 1878.

The trustees of the Medical College of South Carolina having, at the suggestion of the faculty, in 1837, created a professorship of Pathological Anatomy and Medical Jurisprudence, Dr. Geddings was invited to take the chair, which he did, resigning his chair in the University of Maryland. Prof. Geddings had an invitation to accept a chair in the Medical College of Ohio at Cincinnati, the Medical College at Louisville, Ky., and also from the College of Physicians and Surgeons in New York city.

On the death of Prof. Wagner, in 1841, the chair of Surgery was tendered to him, and to which he was unanimously elected, which he filled with ability. In 1849, when Prof. Dickson removed to New York to fill a chair in a college in that city, Prof. Geddings was, by general consent, transferred to the chair of Institutes and Practice of Medicine. After three years' experience in New York, Dr. Dickson returned to Charleston, and, with great magnanimity, Dr. Geddings resigned the chair of Institutes and Practice of Medicine, and accepted that of Surgery, so as to enable Dr. Dickson to resume his relations with the faculty. In 1858 the Doctor, desiring to curtail his labors, resigned the chair of Surgery, and retired from public teaching, but on the unexpected death of Prof. Gaillard he consented to complete his course of lectures, and, at the earnest request of the faculty, returned to the chair of Institutes and Practice of Medicine.

The late war put a peremptory end to the operations of the college, and at the same time swept away all the resources Dr. Geddings had saved by a long and laborious professional life to purchase comforts in old age. Even his valuable library, then one of the choicest in the South, and all his instruments and appliances for teaching, were destroyed by fire in the burning of Columbia, where they had been stored for safe keeping. His house had been plundered in Charleston, and all his surgical instruments stolen.

The Doctor was appointed and served as surgeon in the Confederate army until the surrender of Charleston. He did not leave with the Confederate army, but remained. The commander of the United States troops placed the college building under his charge, which to some extent preserved it and the museum from

complete destruction. All the college professors survived the war. But it was chiefly due to Dr. Geddings' energy that the building was again put in condition to receive a class, and lectures again delivered in it. In 1871 he tendered his resignation and was elected Emeritus Professor of the Institutes and Practice of Medicine, and a new chair of Clinical Medicine was created, to which he was elected, and for two years gave clinical lectures at the hospital where some years before a medical and surgical polyclinic had through his instrumentality been established.

The Doctor was a ready and forcible writer. I have, however, seen no comprehensive list of his productions; they are scattered through the medical journals and Transactions. In 1859 Thomas S. Waring, M.D., and Samuel Logan published, with his consent, a volume of 560 pages entitled "Outlines of a Course of Lectures on the Principles and Practice of Surgery," taken by them during a course of lectures; a Valedictory Address to the Graduating Class of the Medical College of the State of South Carolina, March 12, 1852, of 27 pages, published by the class; his Report on Medical Education to the American Medical Association in 1871, of 39 pages, was published in the *Transactions*, and also in pamphlet form. Prof. Geddings had a work on Practice ready for the press, and arrangements with H. C. Lea to publish it, when the war broke out and prevented its accomplishment. The manuscript of this book was burned with his library in Columbia. The Doctor continued a student and a laborer to the close of a life of over sixty years in a profession which he endeavored constantly to elevate.

The Medical Society of South Carolina, on the announcement of the Doctor's death, held a special meeting and passed appropriate and eulogistic resolutions of respect for his memory, and appointed a committee to prepare a biographical sketch of him and his professional services, and further resolved to have a portrait of the Doctor painted and hung in the hall of the Society. The Society, in compliance therewith, has published in a pamphlet of seventy-one pages a carefully prepared biographical sketch by the committee, with the eulogistic remarks of the various members. This has furnished the data for this notice.

J. M. T.

HAMMER, ADAM, M.D., of St. Louis, was born in Baden, Germany, Dec. 27, 1818; died at Griesbach, in Baden, after a brief illness, August 4, 1878. Educated at Bruchal, where he carried

off prizes in every class, and at the University of Heidelberg, where he studied both the sciences and medicine, he finally received his professional degree in Paris. He came to St. Louis in 1848, entering at once on the practice of his profession. He remained actively engaged until a short time before his death, visiting meanwhile Europe on several occasions, and serving as Surgeon (U. S. V.) in the late war. His *penchant* was for surgery, and at one time he devoted much attention to the eye.

His mind was most versatile and powerful, and, blessed with a remarkable memory, he carried weight both at the bedside and in debate. He gave several articles to the medical journals on surgical and histological subjects. For a number of years he was engaged in teaching, having been instrumental in the organization and conduction of three medical schools in St. Louis, Mo. He had held membership in the National, the State, and the city medical societies, having been honored with the presidency of the latter.

Being of social habits, his health was not robust. In personal appearance he was spare and decidedly Germanic; in tastes æsthetic, indulging in flowers, plants, and music; was of a mercurial temperament, and a free thinker. "He introduced the use of ether in the practice of obstetrics in Germany. He was among the first to explain the true pathology of sunstroke and its proper treatment." He also was among the first to call attention to thrombosis of the coronary artery, and was the first to diagnose that condition in the living.

In his early years he had joined the revolutionists in Germany, and through their failure was driven from his home, seeking refuge in this country. He was married to a brilliant German lady, with whom he lived without issue. The medical profession of St. Louis passed fitting commemorative resolutions.

A. J. STEELE, M.D.

HUBBARD, GEORGE W., M.D., was born in Hopkinton, N. H.; died at his residence in Lansingburg, N. Y., Jan. 19, 1876, in his fifty-third year. Having spent some time as a student at Dartmouth College and received a good academic education, he commenced the study of medicine with Dr. Davis, of Sutton, N. H. He attended lectures and graduated M.D. at the Vermont Medical College in June, 1845. Shortly after this he opened an office and began practice at Bradford, where, however, he remained but a short time when he removed to East Washington,

and from there to Manchester: in each place he met with a fair measure of success and encouragement.

The habits of thought and the extensive information possessed by the Doctor on political matters led to his election to various positions in the legislative and administrative affairs, having served as alderman, postmaster, member of the legislature, and school commissioner. From 1853 to 1859 he edited with ability the *New Hampshire Journal of Medicine*. In May, 1861, he was commissioned surgeon of the 2d N. H. regiment of volunteers, but on the 30th of Sept. the same year he resigned to accept the position of surgeon in the United States volunteers, a position which he filled with ability and to the entire satisfaction of all his superior officers, having had supervision of hospitals and divisions in the field. There was a George H. Hubbard who resigned a captaincy in the 10th regiment of N. H. infantry June 9, 1863, but I suppose not to have been the same as the subject of this sketch.

Dr. Hubbard concluded his medical services in the army as surgeon in charge of the U. S. Hospitals at Troy, New York. On being mustered out of service after the close of the war, the Doctor settled at Lansingburg, N. Y., and engaged in the practice of his profession. Here he rapidly acquired an extensive business, and the respect of his brethren in that place and in Albany. He was a member of the New Hampshire State Medical Association and a representative from it to the American Medical Association in 1858; also a member of the Massachusetts State Medical Society; the Rensselaer County Medical Society and its president. In 1868 he received the honorary degree of A.M. from Dartmouth College. He was for some years attending physician to Marshall Infirmary in Troy; health officer of Lansingburg; and one of the visiting physicians of the Insane Asylum, and a member of the board of governors of this institution. Although he was a ready and forcible writer, I am unable to refer to any specific paper except his Eulogy on the Life and Character of Dr. T. C. Brinsmade.

Dr. Hubbard was married, and leaves a family to cherish his memory. He possessed in an eminent degree the essential virtues of the wise physician—intelligence, kindness, and devotion to professional duty.

From data furnished by M. H. Burton, M.D.

J. M. T.

HUGHES, EDWARD W., M.D., of Grenada, Miss., was born at Charleston, Va., March 15, 1819; died of yellow fever at his residence in Grenada, August 31, 1878. His father was of Irish descent, and for some time a teacher in Washington City. The Doctor received his academical and classical education at the Academy at Charlestown, Va., and in the District of Columbia. His medical degree was obtained from the University of Louisville, Ky., in 1847. Going South, he settled the same year at Grenada, Miss.

In 1842 he was married to Mary N., daughter of John Gibbs, Esq., of Grenada, Miss. The Doctor had been for years the most prominent physician in the northern part of the State of Mississippi. He was a man of culture and energy, and fully abreast with the leading medical men of the country. He was a very strong advocate for the establishment of the State Board of Health, and a member of it when he died.

He is the author of a "Report on Scarlatina," "The Topography and Diseases of North Mississippi," "Cerebro-Spinal Meningitis," "Vaccination and Compulsory Vaccination," which were contributed to the State Medical Society and the leading medical journals.

He was a member of the Grenada County Medical Society from its foundation, and its president in 1872. Member of the Mississippi State Medical Society; was its second vice-president in 1875, and in 1878 first vice-president. A member of the American Medical Association since 1869; and a member of the International Medical Congress which assembled in Philadelphia in 1876. Dr. Hughes labored most heroically and unremittingly during the prevalence of the fever among his neighbors and friends and fell at his post. His last words to his physician, Dr. W. P. Beatty, were, "Bury me like a gentleman and physician."

Data from the public press and the "Physicians and Surgeons of the United States," Transactions of the Mississippi State Medical Association, and Dr. L. L. Saunders, president of the Board of Health, Grenada.

J. M. T.

KNIGHT, WILLIAM LAMBDIN, M.D., was born on a farm near Wheeling, West Va., Feb. 23, 1811; died at his residence in Philadelphia, May 31, 1877. His father had taken an honorable

part as a soldier in the Revolutionary War, and then engaged in agriculture to provide for his family and enjoy domestic life.

The subject of this sketch passed the early period of his life on the farm, where he assisted by his labor to support a sister and three brothers. His opportunities to obtain a literary education were limited and meagre, being confined to a few months' attendance in winter at the ordinary log school-house with a travelling teacher.

But by force of character he prospered, and by self-development became a cultivated scholar and a skilful physician. At the age of eighteen he lost his father by death, when the family removed to Newark, Ohio, and the Doctor obtained a clerkship in the apothecary shop of Dr. Wilson. Here his industry and studious habits attached him to his employer, made him friends, and gave opportunities for reading and more extensive study than he had ever before enjoyed. Having resolved to qualify himself for the practice of medicine, he lost no opportunity to acquire knowledge to that end. In 1834 he had so far prepared himself that he went to Philadelphia and became a pupil of Dr. Samuel McClellan, and at the same time was a resident student at the Philadelphia Dispensary on Fifth Street.

He also matriculated and attended lectures at the Jefferson Medical College. The practice which he saw at the Dispensary gave him much insight in the diagnosis and treatment of disease. The Nurses' Home was established about this time, and Dr. Knight recognized as possessing qualities specially fitting him for obstetrical practice in it, and for which in future life he became quite eminent.

In 1837 he received his degree of M.D. from the Jefferson Medical College. His thesis was on Hydrocephalus or Tubercular Meningitis. His pecuniary wants while a student made it necessary for him to labor somewhat outside of his profession, and by obtaining a situation to keep books for a commercial house, which he posted at night, he thus added to his slender support until he graduated. After he became well established in business his professional remuneration for many years yielded him seven thousand dollars annually. In 1839 he was united in marriage to Miss Martha Howe Morris, an English lady of high culture with whom he became acquainted in Newark, Ohio. She bore him three sons and two daughters, and died of consumption in 1862. In 1870 he married Miss Harriet Louisa

South, only daughter of G. W. South, of Philadelphia, who survives him.

The Doctor was laborious and unostentatious, and from preference did most of his practice on foot. But he indulged his taste for the æsthetic in surrounding himself in his elegantly furnished house with many paintings of merit and expensive articles of rare beauty and value. He possessed a fine library and some quite rare books, and although an extensive reader was averse to writing, and indeed it is not known that he contributed anything to medical literature. His collection of paintings contained quite a number of exquisite beauty and rare artistical merit. His tastes led him also to the cultivation of music, in which he found pleasure and relaxation in the bosom of his family, who were also musical, from the fatigue of professional labor and the cares of a busy life.

Dr. Knight was a man of fine personal appearance, about six feet in stature, erect, and of pleasant, graceful form, and military carriage, a high forehead, gray eyes, prominent nose, cheerful and pleasing countenance, denoting benevolence and culture.

His deportment in the sick-room was cheerful and encouraging, with a number of personal traits that greatly endeared his patients to him. His religious convictions led him to connect himself with the Episcopal Church, of which he was an exemplary member. Although not inclined to authorship, he associated himself with the various medical societies of the city, joining the Philadelphia County Medical Society in 1851, which he frequently represented in the State Medical Society, and was vice-president in 1866, and president in 1869. Member of the State Medical Society, and the American Medical Association. Dr. Henry H. Smith, in an admirable sketch of his life, from which I have largely drawn for this report, says:—

“In the life of Dr. Knight we readily recognize the certain result of an unswerving devotion to duty in every position in which he was placed: as a man, as a physician, as a husband, and as a father. Reverencing all that was noble and good, and with unusually high conception of the lofty character of the true physician, he so moulded and conformed his conduct as to keep his ideal ever before him; seeking, by his meek and unassuming deportment, rather the approbation of God and his own conscience, than the applause or praise of his fellow-men.”

His remains are interred in a central portion of Middle Laurel

Hill Cemetery, where a chaste and appropriate monument marks the spot in that lovely city of the dead.

J. M. T.

NAUDAIN, ARNOLD S., A. M., M.D., was born at "Snow Land," Kent County, Delaware, January 6, 1790. Died January 4, 1872, at Odessa, Delaware, and is buried at Drawyer's church near that village. His Huguenot ancestors left France after the revocation of the edict of Nantes, going to England, and ultimately finding the refuge afforded by America. His great grandfather, Elias Naudain, settled in Appoquinimink Hundred, in the lower part of New Castle County, Delaware, building there a handsome house of English brick, with portholes for defence, overlooking the Delaware Bay. It is still in possession of the family connection. This gentleman was known in early colonial history as the "Huguenot Naudain." His brother was court physician to Louis XIV., and many of his direct lineage were physicians of prominence in France. See Camden Society papers, London, 1871.

Dr. Naudain's parents were possessed of both inherited and acquired wealth, enabling them to educate their son at the best academies and to graduate from Princeton in 1807. He commenced the study of medicine with Dr. Sykes, at Dover, Del., taking his degree from the University of Pennsylvania in 1810. At this time the "Green Box" was instituted. "Its origin is best explained by minutes of March 20th. This day, from certain difficulties having arisen, the professors commenced the practice of examining candidates *behind a screen*. Mr. Naudain, of Delaware, a distinguished citizen of that State, and Senator of the United States, was the first candidate examined in this manner." See p. 116, Carson's History Medical Department of University of Pennsylvania, Philadelphia, 1869.

The second war with Great Britain, 1812, found him surgeon to the forces of Delaware for the defence of Baltimore. His father purchased him a fine property in Dover; the prominent physician soon died when he acquired much of his practice. He married Miss Mary Schee of "Mount Airy," "a relative possessed of rare personal beauty and great worth of character," by whom he had six daughters and two sons.

Three of the daughters married physicians: James E. Ellis, M.D., of West Chester, New York; Wm. N. Hamilton, M.D., F.R.C.P. and S. Dub., of Odessa, Delaware; and Clayton A. Cow-

gill, M.D., of Orange Mills, Fla. One of the others married Hugh Alexander, Esq., of Chicago, Illinois; another A. Boyd Hamilton, Esq., of Harrisburg, Pa.; while the youngest daughter died unmarried. His eldest son, James Schee Naudain, M.D., gave brilliant promise, but unfortunately died at the early age of 33. He used cold baths to allay the febrile heat in scarlatina as early as 1838.

Dr. Naudain removed, shortly after marriage, to "Mount Airy," not far from Middletown, Delaware, where he continued his profession. In the midst of a lucrative practice he was elected to the House of Representatives, and chosen Speaker, in 1826. Governor Poindexter in 1827 appointed him Judge of Common Pleas of Delaware. In 1830 he was elected U. S. Senator, and for a second term in 1834. His political life was above reproach, and he was intimate with Clay, Webster, and the leaders of that day. Letters of the Hon. Theo. Frelinghuysen, Senator from New Jersey, speak of a letter from Dr. Naudain as being as welcome as "apples of gold in pictures of silver." After his term in the U. S. Senate he became in 1841 the collector of customs at Wilmington, Delaware, and inspector of light-houses for Delaware Bay. In 1845 he removed to Philadelphia, resumed life as a physician, became a member of the American Medical Association in 1847, "enjoyed a high reputation for professional skill." He was a member of the Pennsylvania State Medical Society, Philadelphia County Medical Society, and Northern Medical Association of Philadelphia. In the course of active practice he was an occasional contributor to the medical periodicals then existing. He was identified with the founding of "Green Hill" Presbyterian Church near his residence on North Broad Street, and lived to see it one of the flourishing congregations of the city. Impaired physical activity compelled him to relinquish the pursuit of his profession.

In personal appearance Dr. Naudain was above six feet in stature, of commanding and dignified presence, with the utmost benevolence expressed in every feature, possessed of courteous manners and most amiable disposition, extremely hospitable and generous. He delighted in conversation, retaining his versatile mental powers to the last. In domestic life he was affectionate, genial, and indulgent, the Christian gentleman. He died at Odessa, Delaware, in 1872, at the residence of his son-in-law, Dr. Hamilton, surrounded by his daughters, his wife having

died previously. The Rev. Dr. Crowell preached a sermon from the appropriate text: "Let me die the death of the righteous, and let my last end be like his."

HUGH HAMILTON, M.D.

POTTER, MILTON GROSVENOR, M.D., was born at Bennington, Wyoming County, New York, August 29, 1843; died at his residence in the city of Buffalo, January 28, 1878.

He was the son of Dr. Milton E. and Mary L. (Grosvenor) Potter, of Attica, N. Y. His grandfather, Dr. Benjamin Potter, was one of the earliest physicians to settle on the Holland land purchase, receiving his license to practise from the Genesee County Medical Society in 1813. The subject of this sketch lost his mother when he was but four years of age; he was therefore early left to the special care and training of his father. His preliminary education was obtained at the schools of the neighborhood, and his academic at the Kimball Union Academy, Meriden, N. H. When sufficiently advanced he entered the University of Rochester, from which he graduated with honor in 1864. Possessing a combative and argumentative turn of mind, he for some time contemplated studying law, but possibly his health determined him to devote himself to the study of medicine. Naturally his office studies were prosecuted under the supervision of his father. He attended lectures at the medical department of the University of Buffalo, from which institution he received his degree of M.D. in 1867.

As a part of the public exercises of the commencement he was chosen by the class to deliver the valedictory, which he did with much credit to himself and to the satisfaction of the class and faculty. Shortly after receiving his degree, Dr. Potter decided to make Buffalo his home, that he might the more profitably pursue the study of his profession. To this end he formed an association with Dr. J. S. Smith, who had charge of the lying-in asylum, a branch in which he was much interested. This arrangement continued until 1871, when by mutual consent it was dissolved. He was also for some years in his early practice associated with Prof. Rochester in the medical wards of the hospital of the Sisters of Charity as clinical assistant.

He early attracted the attention of his contemporaries by his exactness in physical diagnosis, and was frequently assistant to Prof. White in important surgical operations.

After six years' devoted and satisfactory service in the hospital, a ward was assigned to him, which after a time he resigned to attend to other pressing duties.

At the request of Prof. Charles A. Lee, during the college session of 1868-69, Dr. Potter relieved him somewhat from the labors of this position by delivering a portion of the lectures on *materia medica*. During the lecture term of 1870-71, he lectured on anatomy, and the following year, on the resignation of Prof. Sanford Eastman, Dr. Potter was elected to that chair. He labored zealously and filled the position with credit, and commanded the attention of the class. At the close of the lecture term 1873-74 Prof. Potter was made dean of the faculty. Besides his duties to the college for the last three or four years of his life he was one of the medical attendants of the Buffalo General Hospital, and was also medical attendant of the Buffalo Orphan Asylum and Church Home. In 1870 he was attacked with influenza, which finally developed into chronic asthma.

Notwithstanding he travelled and changed residence to localities which usually afford relief to asthmatics, such as the American Lakes and the table lands of New Mexico and Colorado, and remained there for over a year, he was not in the least benefited.

For a time he fixed upon Scranton, Pa., as a place of residence under the belief that he found some relief to the more distressing symptoms.

Gradually the sequel to asthma, enlargement of the heart, presented itself, and added to his suffering. Earliest examination of the chest failed to detect tubercular deposits, but on his return from New Mexico and Colorado, this additional fatal complication was manifested to his friend and colleague, Dr. Rochester, and communicated to him as delicately as possible, as he well knew its import. Although greatly reduced in strength, and a constant sufferer, he persisted in taking his position in the college session of 1877-78, and up to Friday, Dec. 14, continued, but on that day delivered his last lecture. After this he was too weak to leave his room, and from this time to the close of life his strength gradually failed. Dr. Potter was united in marriage April 5, 1866, to Miss Clara Chase, of Syracuse, New York, who, with a son and daughter, survives him. He was a man of religious convictions, and strong Christian hope, which supported him in his last hours, as they had been his guide

through life. As a physician he had been earnest and conscientious. To his patients he was attentive, kind, gentle, and forbearing. His success in general practice was perhaps above the average of young physicians.

He inherited from his father great energy and perseverance, and with him to live was to work and win success by meriting it, whether in the lecture-room or in the rounds of general practice. Dr. Potter was a member of the Buffalo Medical Association, the Erie County Medical Society, the New York State Medical Society, and the American Medical Association since 1872.

The Erie County Medical Society held a special meeting, and passed feeling and appropriate resolutions of respect to the memory of Dr. Potter and attended his funeral in a body. The Alumni of Buffalo Medical College also held a special meeting, and evinced by resolutions their regard for the deceased.

Dr. E. N. Bush was appointed by the Erie County Medical Society to prepare a sketch of Prof. Potter's life, which he performed in a most satisfactory manner. It was published in the Buffalo papers, and furnished the materials for this notice.

J. M. T.

RILEY, Jno. C., M.D., was born in Georgetown, D. C., December 15, 1828; died at his residence, in Washington, D. C., February 22, 1879. He was the son of Dr. Joshua Riley, of Georgetown, D. C., who for fifty years was actively engaged in practice.

Dr. John Riley studied and graduated at Georgetown College, and soon after became a student of medicine in the National Medical College, Washington. Here he received his medical degree in 1851, and immediately entered upon the practice of his profession. In 1859 he succeeded his father in the chair of *Materia Medica*, Therapeutics, and Pharmacy in the Medical Department of the Columbian University, and continued to lecture without interruption until within a short time of his death. He was the author of a text-book on *Materia Medica* and Therapeutics, which has had a deserved reputation for its conciseness and suitability to the needs of the student. Dr. Riley was popular as a lecturer, and his great familiarity with his subject made his lessons of value and interest to his hearers. For many years he was dean of the faculty, and performed the numerous duties of this position with satisfaction to his colleagues. He was a mem-

ber of the Medical Society of the District of Columbia, of the Medical Association of the District of Columbia, of the American Medical Association, and of the Philosophical Society of Washington. He was the only surviving member of the committee to revise the *Pharmacopœia* of the United States, and he was also secretary of this committee. Under the old city government he was a member of the Board of Health for two years, and was president of the board for one year. When the pharmacy bill was enacted by Congress, in 1878, for the regulation of the sale of drugs, and for fixing a qualification for those engaged in the sale and compounding of medicines, Dr. Riley was made one of the commissioners of pharmacy. He was consulting physician to Providence Hospital, to the Central Free Dispensary, and to the Washington Eye and Ear Infirmary.

Assiduous devotion to duty may, no doubt, be accepted as one of the causes of Dr. Riley's death, which took place at the age of fifty years. Some years prior to the full development of the disease, there were some indications of failing health, but he did not abandon work until within three weeks of the fatal termination. Uræmic coma and convulsions from Bright's disease were the final symptoms of his malady.

He was much esteemed in the community as a useful citizen, and had many personal friends, who were endeared to him by his unusual amiability and affectionate disposition. His wife and three children survive him.

W. W. JOHNSTON, M.D.

SUTTON, WILLIS E., M.D., was born in Aurora, Ind., July 2, 1848; died at the residence of his father, in the same place, Feb. 24, 1879. He was the son of Dr. George and Sarah (Follre) Sutton, of Aurora. The subject of this sketch from childhood had a feeble constitution, which was probably owing to an attack of Asiatic cholera when but about one year old.

As he grew up he became more robust, and received a good academical education at Moore's Hill College. Subsequently, he spent some time at Wabash College. In 1869 he began studying medicine with his father, who was then, and still is, a prominent physician of that section of Indiana. Having prepared himself for the college class-room by a careful course of reading, he attended two full courses of lectures at the Medical College of Ohio, where he graduated M.D. in 1872. Being am-

bitious for further acquaintance with medical science, he attended lectures the following winter at the Jefferson Medical College, Philadelphia, and was assiduous in his studies at the hospitals of that city. On returning to his home in the spring, he commenced the practice of his profession along with his father. He was thoroughly in love with the profession of his choice, a close observer, and a careful and extensive reader of the latest literature, and best methods of diagnosis and practice.

He at once connected himself with the Dearborn County Medical Society, an organization which his father assisted in founding in 1844. Dr. Sutton inherited much of the mental activity of his father, and interested himself from the start in the various questions that lay in the path of the professional man's life. He was quite an expert with the microscope, by which, with his father's assistance, he had been enabled to prove the existence of trichina in 1874. (See report by Dr. G. Sutton to the State Medical Society in 1875.) The Doctor's scholarly habits, devotion to professional duty, and his agreeable manners rapidly led him into a full professional business. In the spring of 1877 he made a trip to Memphis for relaxation, but, unfortunately, while returning he was overtaken by a rain-storm at Evansville, when he caught cold, which developed into pneumonia. From this period there had been noticed a gradual failure of his health. He spent part of the summer in Minnesota, and in the fall of the year 1877 he went to Florida, where he spent the winter. Last fall he went to Texas, but returned after an absence of about six weeks without being benefited. Finding more comfort at home, he spent the remainder of his days in the company of his own family, and the citizens who had known him from childhood.

He was a member of the Dearborn County Medical Society, the Indiana State Medical Society, and the American Medical Association since 1875. The members of the Dearborn County Medical Society held a special meeting to take action when his death was announced. They passed a series of appropriate resolutions, and attended his funeral in a body.

He was also a member of the Aurora Fire Company, which passed resolutions of respect and also attended his funeral.

A handsome eulogy appeared as an editorial in the *Dearborn Independent* of the 24th of February, 1879.

J. M. T.

WHITEHEAD, PETER FLANAGAN, M.D., was born in Winchester, Clark County, Ky., June 9, 1838; died of yellow fever at Vicksburg, Miss., Sept. 5, 1878. He was the son of James Nelson Whitehead, a merchant of Winchester; his mother was Catherine, daughter of Peter and Ruth Warrick, of the same place. His grandfather, John Whitehead, married Margaret Proutt, and removed from Virginia to Kentucky before 1800. His ancestry had served in the Revolution, and received land from Virginia, upon which to settle, in Fayette County, Ky., for the services rendered in the war for independence.

The subject of this sketch received his academical education at the Winchester Academy. His medical studies were begun with Dr. H. Taylor, in Winchester, in 1857. After the usual office studies he attended medical lectures at the Jefferson Medical College of Philadelphia, where he graduated in 1859. His thesis was on "Cyanosis Neonatorum."

The same spring he was selected as one of four graduates to serve one year as house physician in Blockley Hospital, Philadelphia. Immediately upon leaving the hospital he opened an office at Independence, Ind., where he was making friends and securing professional employment when the war broke out.

Dr. Whitehead joined the Confederate army as surgeon of the Missouri State Guard, and served the lost cause till the final surrender, first as surgeon to a regiment, and then as surgeon to Loring's Division, a position he held when the war closed and his division surrendered at Greensboro, N. C. When the State Guard was mustered out he was recommissioned and served in Col. Eugene Erwin's regiment. He was at the siege of Vicksburg, where he gave valuable professional aid to many a sick and wounded soldier. As a physician he was gentle, devoted, and untiring, always evincing the greatest interest in his patients, who became wonderfully attached to him. He was of a chivalric nature, with a commanding figure, courtly manners, industrious and studious, and of correct habits. With such a character he could not be other than a favorite, as well as an efficient and skilful physician and cherished friend. Dr. Whitehead was united in marriage to Irene Cowan, of Vicksburg, in 1865.

On retiring from the army he settled to practise in Vicksburg, and he soon acquired a large and responsible business, which he enjoyed to the time of his death.

As expressive of the esteem in which the deceased was held, the following dispatch to the *Louisville Courier Journal* from Vicksburg will attest:—

“This is the darkest day we have yet seen; Dr. Whitehead is dead. He was a Kentuckian, and Kentucky may well be proud of her son and mingle her tears with ours, for she has none left that are nobler than he. He was the very type of a perfect man, strong as a lion, gentle as a woman, handsome as a god. Among his professional brethren he was the acknowledged head, yet none were more modest than he. Nature had placed the stamp of nobility upon his brow, and he who ran might read it. When the fever broke out he might well have gone as others did. His practice was confined to a class of people who have the means to go North every summer, and who had gone this time, but he stood by his people in their hour of need, and he died in the cause of humanity. Vicksburg will long remember him, and Kentucky will be untrue to herself if, high on the roll of her distinguished sons, she fails to engrave the name of P. F. Whitehead.”

Medical organizations found in him an ardent and able supporter. He was a member of the Vicksburg Medical Society, of the Mississippi State Medical Association, and its president in 1874. He was also a member of the American Medical Association in 1875, and since that time served upon the Committee on Necrology for the State of Mississippi. Upon the establishment of a State Board of Health Dr. Whitehead was appointed a member, and held the position until the time of his demise.

He made occasional contributions to the literature of our profession, some of which are published in the Transactions of the State Medical Association of Mississippi. He was also a welcome contributor to the *Richmond and Louisville Medical Journal*. He had passed through several mild epidemics of yellow fever, but never had the disease, and although fully aware of his danger, his appreciation of the duty of the hour never for a moment permitted him to think of going to a place of safety when the disease became alarming in 1878. Day and night he labored without rest among the pest-stricken victims in the city of his adoption. His heroic services were just what his noble nature would lead you to expect. He laid down his life while succoring his fellow-man. What more could man do? The Board of

Trustees in his native town held a meeting on the announcement of Dr. Whitehead's death, and passed resolutions of respect and sympathy with his friends in their loss. The resolutions were published in the public press. The physicians of Winchester and Clark Counties held a public meeting, at which his old preceptor, Dr. H. Taylor, presided, when appropriate eulogies were delivered, and resolutions portraying his life and services were adopted and published. An editorial of power appeared in the *Louisville Courier Journal* upon the life and services of Dr. Whitehead and the heroic band of physicians who throughout the epidemic had struggled against the life-destroying pestilence which was raging in the Mississippi Valley. An admirable tribute, too, was paid to his memory by Dr. C. A. Rice, at the meeting of the Mississippi State Medical Association, April 2, 1879.

From advance sheets of the Transactions of the Mississippi State Medical Association and from the public press.

J. M. T.

WITHERS, THOMAS, M.D., was born at Poplar Circle, Dinwiddie County, Va., July 30, 1808; died at his residence in Petersburg, Va., April 6, 1879. He was the son of Thomas and Elizabeth (Grammer) Withers, respectable farmers. The mother of the Doctor was the daughter of John Grammer, of Petersburg, Va. William Withers, of Yorkshire, England, born 1731, died 1816, was the father of Thomas Withers, and grandfather of the subject of this sketch. They lived, one to the age of seventy-two, the other to seventy years.

His grandfather, William Withers, was the personal friend and private secretary of Governor Dinwiddie during his whole administration. The Doctor was a man of active, sympathetic, and humane feelings, and when Senator C. C. Clay was confined at Fortress Monroe he manifested great interest for his personal comfort, as indeed he did for all prisoners and persons in distress and suffering. The Doctor was thoroughly prepared for college at Jonathan Smith's school in Petersburg. At the age of sixteen he was sent to Hampden Sidney College, where he acquired a good classical education. He attended lectures at the University of Pennsylvania one course, and his second at the University of Virginia, where he graduated M.D. in 1834. The same year he commenced practice at Kingston, the former resi-

dence of Gen. W. H. Brodnax, in Dinwiddie County. On the death of this gentleman the Doctor was left executor of his estate, which was very large. About 1844 Dr. Withers went to reside upon his cotton plantation near Greensboro', Ala. His health suffered from the climate so, that he returned to Petersburg in 1847, and resumed practice, in which he was actively employed up to the time of his death.

As a general practitioner he was successful as well as popular, but rather averse to surgery. He was, at various times, a member of the city council; for years he was director of the Commercial Bank, and president when he died. Had long been president of the Petersburg Library Association, a member and president of the Medical Faculty of Petersburg, a member of the Medical Society of the State of Virginia, and of the American Medical Association.

Throughout his life Dr. Withers was delicate, fastidious, and careful in dress, and in his diet seldom used spirits or tobacco. He was of spare frame, medium height, and graceful person. His tastes were refined and intellectual; though reading poetry with zest, he rather preferred professional, grave, and religious subjects. He was, in a word, a noble specimen of the cultivated Virginia gentleman. The Doctor was, for many years, a vestryman of St. Paul's Episcopal Church, and also lay reader. He accumulated a large estate, which he devised mostly to his nephews and nieces. He left \$30,000 to the Theological Seminary in Alexandria, Va.

Data from "Physicians and Surgeons U. S.," and Major N. M. Tanner, of Petersburg.

J. M. T.

WOOD, GEORGE B., M.D. The increasing burden of age and infirmities had compelled Dr. Wood to seclude himself for so many years, that to a very large proportion of the active men of the medical profession of the present day he was personally almost or altogether unknown. It is true that all over the United States there are still those who retain the grateful memory of his ability and faithfulness as a teacher, and who have known and appreciated him as an associate. But the number of these is becoming year by year smaller, and, in the natural order of things, they will all before long have followed him to swell the ranks of "the majority." Hence it is the more desirable, now

that he has passed away from earth, that honorable mention should be made of his life and services, and that they should be placed upon record, not only in token of their value, but that they may furnish example and encouragement to all who assume the duties and responsibilities, and aim at the rewards, of the calling which he so eminently adorned.

George Bacon Wood was born on the twelfth of March, 1797. His father, Richard Wood, was an extensive land-owner and farmer in Greenwich, Cumberland County, N. J. He was of English descent, his first ancestor in this country having come over from Bristol, England, with William Penn at the time of his second visit in 1682.

This Richard Wood married as his second wife Elizabeth Bacon, who, like himself, was of good family, and a member of the Society of Friends. Of this marriage the subject of the present memoir was the eldest child. At the early age of twelve years he showed the force of his character by requesting his father to give him a liberal education, the expense to be deducted from his share of the paternal estate. With equal good sense, the father acceded to the son's desire, and sent him to school in New York, whence he came to the University of Pennsylvania, and was graduated with high honors in 1815. Proceeding at once with his medical studies, he entered the office of Dr. Joseph Parrish, a distinguished practitioner of that day, and took his degree at the University in 1818, the subject of his thesis being "Dyspepsia."

He engaged at once in teaching; but beyond this fact no details are available to the writer. It is, however, certain that he was successful, since, in 1821, he was elected to the chair of Chemistry in the College of Pharmacy, taking the place of Dr. Gerard Troost, the first professor, who retired after holding the position but one year. For ten years Dr. Wood lectured on this subject, and was then transferred to the chair of Materia Medica and Pharmacy in the same institution. Here he remained, with a growing reputation as a teacher, until 1835, when, upon the retirement of Dr. John Redman Coxe, he was called to the professorship of Materia Medica and Therapeutics in the University of Pennsylvania. In 1850 he was again transferred; this time to the chair of Theory and Practice of Medicine, left vacant by the resignation of Dr. Nathaniel Chapman. In this important position he continued, fully sustaining the reputation which his

former labors had established, until he voluntarily retired into private life in 1860.

From 1835 to 1859 Dr. Wood was one of the attending physicians to the Pennsylvania Hospital; and here he had very large classes, the clinical lectures at this institution being, for a portion of the time at least, the only ones available to students in this city. There were, indeed, medical clinics held at the schools, but at these the more serious cases could not, of course, be presented.

Besides these public services, Dr. Wood was in the habit of taking office pupils, to whose training he gave the most accurate and faithful attention, and by whom he was invariably held in the highest respect and esteem. His private class was always a very large one, larger than that of any other preceptor of the time, and was kept up until about the year 1855.

It needs but a glance at this brief record of *forty-two* years of continuous teaching to impress us with the vast influence exerted by this one man upon the medical thought and practice of this country. Of the entire period twenty-five years was given to instruction in the theory and practice of medicine; for, although from 1835 to 1850 Dr. Wood was Professor of Materia Medica and Therapeutics, he was all that time delivering clinical lessons at the Pennsylvania Hospital. To the excellence of his lectures on the branch just mentioned, there is abundant testimony. He succeeded in an unusual degree in securing the attention of the students, and in giving freshness and brilliancy to that generally dry and uninteresting subject. For the illustration of his course, he established and maintained a garden and hot-house of medicinal plants, which at his death he bequeathed to the University of Pennsylvania.

With a similar liberality he procured, on his accession to the chair of Theory and Practice, a museum of models of diseases, which cost at least \$20,000, and which was at that time the finest collection of the kind in the country. This he imported from Europe, selecting it during one of his journeys abroad; it also became by his will the property of the University.

Dr. Wood was an animated, fluent speaker, never enthusiastic, but always self-possessed, calm, and dignified. He was a laborious student, strongly imbued with a sense of the importance of his duty as a teacher. He fully believed in the views he set forth, and this honesty, which indeed was a striking feature of

his character, was apparent in his manner, and added much to the force of his instruction. His descriptions of disease were admirable; his explanations clear and full; his illustrations always as complete and accurate as could be obtained. His ideas of pathology and therapeutics were in accordance with the advanced views of the day, except that he retained a confidence in depletory measures which had become unfashionable, but which are now again revived among many practitioners.

Besides his oral teachings, Dr. Wood was a prolific and a very successful writer. He was, perhaps, most widely known as joint author, with the late Dr. Franklin Bache, of the *United States Dispensatory*, a work of vast erudition and research, as well as singularly accurate in every detail. It is needless to say more of a book so familiar to every physician and druggist in the land.

In 1847 appeared the first edition of Wood's *Practice of Medicine*. Its author was still occupying the chair of Materia Medica and Therapeutics in the University of Pennsylvania, but this work, which supplied an existing want in American medical literature, was at once recognized as of standard value, and gained a favor which was substantially attested by the fact that it passed through six editions, the last being brought out in 1866, six years after its author had wholly retired from prominent professional positions.

Another work, the *Therapeutics and Pharmacology*, also met with gratifying success, three editions being called for between 1856 and 1868.

In this connection it may be mentioned that he was also, for many successive years, one of the leading spirits in the conventions for revising the *United States Pharmacopœia*, giving much time and attention to this very important matter, upon which, from the tenor of his studies, he was justly regarded as high authority.

In addition to these heavier labors, Dr. Wood published, from time to time, a large number of lectures and addresses delivered by him on special occasions; and in his earlier life he put forth a poem of some length, which, however, failed to attract any notice.

Dr. Wood held a number of positions of trust and honor in the various scientific bodies of which he was a member. In the year 1845 he was elected Vice-President of the College of Physicians

of Philadelphia, and three years later, he succeeded to the presidency of that body. This office he filled ably and actively, presiding at all the meetings, except during his absence in Europe, until he was finally prevented by physical weakness from so doing. And even then he was retained in office, from year to year, by the loyalty, respect, and affection borne to him by the Fellows, and died invested with its honors.

In 1855-56 he was president of the American Medical Association, in the organization of which he had taken an active part, and the early meetings of which he made it a point to attend.

He was for many years president of the American Philosophical Society, as well as a manager of the Philadelphia Dispensary, and a trustee of the University, to which, as a professor, he had given so long a term of efficient and acceptable service.

Dr. Wood never had a large private practice, although his opinion as a consultant was highly valued. He had a great aversion to obstetrics, and never undertook anything in the way of surgery.

He married in 1823 Caroline, only daughter of Peter Hahn, a wealthy and highly respected merchant of Philadelphia. This union, although without issue, was in an eminent degree happy, and was terminated in 1867 by the death of Mrs. Wood.

Dr. Wood's liberality was so marked a feature of his character as to merit special notice. Of his private benefactions only enough is known to make it safe to assert, that no appeal from a deserving source was ever unheeded by him. When he gave, it was done with a free hand, and in the most delicate manner. When called upon for subscriptions to any public or professional object, he was always ready with a prompt and generous response.

His endowment of the Auxiliary Faculty of the University; his yearly contribution of \$500 to keep the library of the College of Physicians open for the use of the profession; his subscriptions to the Pennsylvania Hospital, to the building fund of the College, the American Philosophical Society, and the Academy of Natural Sciences—all these acts of his life may be cited in evidence of the generosity with which he discharged the stewardship of the ample income which Providence had bestowed upon him.

By his will he bequeathed to the College of Physicians of

Philadelphia all such books in his valuable library as were not already in their collection, released a mortgage held by him on their property to the amount of \$5,000, and added a further sum of \$10,000 to keep their library open for the use of the Fellows and others. To the University he left his museum for the illustration of lectures on the Theory and Practice of Medicine, the value of which has been stated, as well as his collection of growing medicinal plants. He also provided that the University Hospital should receive \$75,000, to be applied in the establishment and maintenance of a ward to be called, not after himself, but after his father-in-law, for whose memory he had a profound respect.

In person Dr. Wood was above the middle height, and remarkable for his erect and dignified carriage. His expression of face was calm and self-possessed, and his manner precise and formal; so much so, indeed, as often to give strangers an undue impression that his character was cold and reserved, if not stern. With his intimates, however, and especially with those bound to him by ties of relationship, he was always cordial, and even genial; and whoever learned to know him found in him a faithful friend, a judicious counsellor, and a true man. One evidence of this, among many that might be adduced, is to be found in the feelings entertained for him by his old hospital residents, his assistants, and his subordinates generally. With them, although strict in his requirements of duty, he was uniformly courteous, just, and considerate; he was slow in giving his confidence, but equally so in withdrawing it. They all came to cherish for him not only respect but affection.

After the death of his wife, to whom he was devotedly attached, Dr. Wood's health and strength slowly declined; in the latter years of his life he suffered much from an enormous accumulation of fat, while his muscular tissue underwent, at the same time, fatty degeneration. His mind was clear, though enfeebled, until within a few days of his death, which took place on the morning of March 30, 1879. He had just entered upon the eighty-third year of a life which had been, during the greater portion of it, eminently successful in the usual sense of that word. His career had not only been without reproach, but fruitful of benefit to others; and he has, no doubt, entered upon his reward above.

JOHN H. PACKARD, M.D.

WOODWORTH, JOHN MAYNARD. Born in Chemung Co., N. Y., Aug. 15th, 1837. His parents removed to Illinois, and he was educated at Warrensville Seminary and the Chicago University. He early displayed a taste for the natural sciences, and in 1858 he took part in organizing the Chicago Academy of Sciences, and became the Curator of its Museum, and while acting in this capacity made several tours west of the Mississippi, collecting specimens. A year later he was appointed Naturalist to the University of Chicago, and was directed to establish a museum of natural history. In the latter part of the year he became a student of Prof. Spencer F. Baird, of the Smithsonian Institution, and remained under his instruction until 1861, when he studied pharmacy in Chicago, and began business on his own account. At this time he attended lectures on materia medica and chemistry at Rush Medical College, and took a special laboratory course under the late Prof. J. V. Z. Blaney. In this year he began the regular study of medicine, and in 1862 graduated at the Chicago Medical College. The war of the rebellion being then in progress, he immediately entered the volunteer service, and was appointed an acting assistant surgeon at Camp Douglas, Ill. Shortly afterwards he was appointed assistant surgeon to the 1st Illinois Light Artillery, and was ordered to his regiment, then in the field near Corinth, Miss. In 1863 he was promoted to Surgeon of Volunteers, and was assigned to duty as Medical Inspector of the 15th Army Corps, then commanded by Gen. John A. Logan. He was subsequently appointed Medical Director of the Army of the Tennessee, under General Logan. During the Atlanta campaign, his field hospitals were the subject of complimentary notices in general orders, on the "march to the sea." He was in charge of the ambulance train, in which was moved one hundred wounded men; and of this number, three had suffered amputation of the thigh; but all arrived at Savannah safely, not a life having been lost among them. The Doctor was brevetted a lieutenant-colonel, and his services were so highly appreciated, that he was the recipient of two communications, one from Major-General Logan, and the other from Brevet-Col. John Moore, Surgeon U. S. Army, approved by General Sherman, in which reference was made to his "patriotism, capability and energy, as well in a professional capacity as in the frequent performance of the duties, by no means obligatory, of aide-de-camp." He was

mustered out of the service in 1865, and in 1866 was appointed Demonstrator of Anatomy in the Chicago Medical College, and in 1868 was appointed Surgeon to the Chicago Soldiers' Home, and Sanitary Inspector to the City Board of Health. In 1871, he was appointed to the office of Supervising Surgeon of the Marine Hospital Service, by Secretary Boutwell, and in 1873 was appointed Supervising Surgeon-General of the same service, by President Grant. He was the first incumbent of these offices, and to carry into effect a general plan of much needed reorganization. The service had been in existence since 1798, but as there had been no one at its head, familiar with professional details, it was wastefully and negligently managed. Hospitals had been built where there were no sailors; vagrants and wanderers generally were admitted to hospitals, to be supported by the fund accruing from taxation of seamen; large, expensive, and inconvenient buildings had been erected, and as there was little responsibility, there was corresponding neglect. Dr. Woodworth, therefore, found in the work of reorganization ample scope for the exercise of his fine executive ability. He wrote new regulations, abandoned the useless hospitals, established a system of appointment and promotion of medical officers, after proper examination, inculcated discipline and economy, and by wise and vigorous measures soon brought the expenditures of the service within its income, a feat which, prior to his administration, had never been accomplished.

During this period he was singularly active in matters for the general public welfare, the immigration service, the quarantines, and public health received a large share of his attention. After the cholera epidemic of 1873, he strove earnestly to direct public attention to the study of the best means for its prevention, and the history of the yellow fever epidemic will be unfairly written if it fails to record the earnest efforts made by Surgeon-General Woodworth to obtain, first, a correct knowledge of the disease, and then to prevent its recurrence. Shortly before his death, he took active measures to prevent the introduction of a more violent and fatal pestilence, the Russian plague. His devotion was so great that he deprived himself of needed rest, and died March 14th, 1879, of nervous exhaustion, brought on from overwork,—a martyr to his zeal in the cause of public sanitation.

His death was dramatic. Seized with a fatal malady at the very moment when he felt that the summit of his laudable am-

bition was about to be reached, he sank into a stupor at its onset, from which he only aroused with a last feeble flicker of his departing life,—he suddenly started—was aware of the presence of his wife and relatives, saw several of his trusted officers around his bedside, gave in a clear but hurried voice his last directions, expressed his hope in immortality, bade farewell, folded his hands across his breast, and peacefully sank to his last long repose.

J. B. HAMILTON, M.D.

WRIGHT, J. J. B., Surgeon, was born at Wilkesbarre, Luzerne County, Pa., April 27, 1801; died of apoplexy May 14, 1878. He graduated in Arts at the Washington College, Pennsylvania, in 1821, and took the degree of Doctor of Medicine at the University of Pennsylvania in 1825. He at once commenced the practice of medicine in the vicinity of his native town, and devoted himself to the duties of his profession in private life until the fall of 1833. October 25, 1833, Dr. Wright was appointed an assistant surgeon in the army; he was promoted to the rank of surgeon March 26, 1844; was retired from active service by direction of the President December 31, 1876, after forty-three years' faithful service in the medical department of the army.

On his appointment as assistant surgeon in the army Dr. Wright was ordered to duty at Fort Gibson, Indian Territory. He served at that station till April, 1835; at Camp Des Moines, Iowa, till November, 1835; at Fort Howard, Wisconsin, to June, 1837; at Fort Snelling, Minnesota, to November, 1838; at Jefferson Barracks, Missouri, to May, 1839; and at Carlisle Barracks, Pennsylvania, to September, 1840. He was then transferred to Florida, and served in that State till March, 1843, including the period of the Seminole war. During the summer of 1843 he was on duty as member of the Medical Board, and was then ordered to Plattsburg Barracks, New York, where he remained till June, 1844, when he returned to Florida, whence, a year later, he was transferred to Texas. Surgeon Wright accompanied the army of invasion and occupation into Mexico, and served with distinction during the war with that country. After his return he had a brief tour of duty at West Point, and then, returning to Texas, served as Medical Director of the Eighth Military Department till June, 1852. After this he was stationed at Carlisle Barracks, Pennsylvania, till October, 1853; at Jeffer-

son Barracks, Missouri, till December, 1855; again at Carlisle Barracks, Pennsylvania, till April, 1857; at Fort Leavenworth, Kansas, till November, 1857; and at St. Louis, Missouri, till January, 1858. Subsequently he accompanied the expedition to Utah, and afterwards was stationed at Baton Rouge, Louisiana, and Fort Leavenworth, Kansas, where he was on duty at the breaking out of the civil war. He then served as Medical Director of the Department of the Ohio till October, 1861; as Medical Director of the Western Department till 1862, and afterwards returned once more to Carlisle Barracks, which (with the exception of a brief tour of duty as President of the Army Medical Examining Board in New York city during the fall of 1863) continued to be his station until the close of his active service, and where he resided after he was retired until his death.

Surgeon Wright always recalled with particular pleasure the years of his service in Texas immediately after the Mexican war. During that period he formed many lasting friendships with citizens of that State, and his departure thence in 1852 was the occasion of marked tokens of regard. In the year 1836 he received the *ad eundem* degree of Doctor of Medicine from the Jefferson Medical College of Philadelphia. After the close of the rebellion he was brevetted lieutenant-colonel, colonel, and brigadier-general "for faithful and meritorious services during the war," to date March 13, 1865, and he was appointed surgeon with the rank of colonel, to fill an original vacancy, June 26, 1876.

J. J. WOODWARD, *Surgeon, U. S. A.*

SUPPLEMENT TO REPORT ON NECROLOGY.

ROLL OF HONOR.

NAMES OF PHYSICIANS WHO DIED OF YELLOW FEVER IN 1878.

THERE are occasions in the history of our profession as there are in that of a nation which taxes the resources and puts the heroic spirit of both to the severest test.

The appearance of yellow fever of a malignant character at many points of the Mississippi Valley during the summer and fall of 1878 is a notable example. The invasion was sudden, if not unexpected, and its spread rapid, and to interior localities, away from water highways, which in former instances had been exempt from its ravages.

As might be expected, there would be found in the path of this epidemic many resident medical men who were unacclimated and only theoretically acquainted with this formidable disease, which, from its severity on this occasion, was denominated by the people the plague.

Notwithstanding the risk of life in such cases, we are not acquainted with a single instance where a physician deserted his post or patients in their hour of need, but on the contrary remained true to duty, and the instances are numbered by the hundred where physicians from every part of the United States, and totally unacclimated, yet volunteered their services and hastened to the fever-stricken localities, laboring efficiently until the epidemic was over, or until they were stricken down by the disease as truly martyrs to the humanity of our profession and as deserving of glorification as any saint canonized for yielding his life to religious convictions.

The following list contains the names of all the physicians who were chronicled as having died of yellow fever in 1878 that I have been able to collect; if any have been omitted it is for want of information, and possibly a few here given may have

been nurses, or from other considerations not entitled to recognition as physicians, as the names have been collected from a variety of sources, chiefly the daily papers.

The names are placed in a separate list from the regular report on necrology for the reason that but a few of them were ever members of the American Medical Association, and yet I risk but little in assuming that you will approbate this record of the devotion to professional duty and the cause in which they died.

There is, however, a numerous list of noble and heroic physicians who labored and suffered untold privations amid the gloom and panic which rested over these suffering communities, and we are proud to say yet live, whose names are not included among the deceased, but who risked their lives equally with those who have gone down in glory to the valley of death in their efforts to save life and relieve human suffering. The public and the profession will remember them and the historian will write their names high among those whose deeds deserve to make them immortal with the benediction on each, "Well done, thou good and faithful servant."

The biographies of some of the deceased have been obtained. Those who were members of the American Medical Association, and whose biographies have been obtained, appear in the regular report on necrology to this Association.

ALEXANDER, F. V. P. Died at Greenville, Miss. Oct. 1, 1878.

ALEXANDER, J. M. Died at Hickman, Ky., Oct. 18, 1878.

ANDERSON, J. M. Died at Hickman, Ky., 1878.

ARCHER, —. Died at Greenville, Miss., 1878.

ARMSTRONG, W. J. Died at Memphis, Tenn., Sept. 20, 1878.

AVENT, BENJAMIN WARD, M.D., was born in Virginia, May 24, 1812; died at Memphis, September 12, 1878. When quite young the Doctor's parents removed to Limestone County, Ala. At the age of 18 he removed to Murfreesboro, Tennessee. He received a good education, and then took up the study of medicine under the supervision of Dr. Walker. He attended lectures at the Transylvania University and also at Philadelphia, and graduated at the former.

He commenced practice in Rutherford County, Tennessee, in 1834. The following year he was married to Miss Nancy Syter, after he removed to Murfreesboro, where he acquired a large practice. On the breaking out of the late war he was made Surgeon-General of Tennessee, and served until the surrender at Appomattox. At one time he was on the staff of General Buckner, and afterwards was in charge of hospitals at Kingston, Opelika, and other points.

At the close of the war he removed with his family to Memphis, Tennessee, and formed a copartnership in practice with Dr. Dudley D. Saunders. They had for years a large and lucrative business. During the epidemic of yellow fever in 1873 he labored efficiently and escaped an attack. At the outbreak of the fever of 1878, some of his friends endeavored to persuade him to leave the city as his health was not as vigorous as usual, but he considered it to be his duty to remain and do all he could for his friends and neighbors. After much laborious practice he was on the 4th of September stricken with the disease, and died on the 12th of September. His remains were interred in Elmwood Cemetery. He was a studious, unobtrusive, conscientious Christian man, and a well informed and skilful physician.

Data from "Heroes, Honors and Horrors of Yellow Fever, 1878."

J. M. T.

BAIRD, EDWARD MONTESQUE, M.D., was born at Murfreesboro, Rutherford County, Tennessee, October 17, 1853; died at Chattanooga, October 13, 1878. He was the son of Josiah Martin Baird, a farmer. His mother was Sarah Jane, daughter of Moses McKnight.

The subject of this sketch received a liberal education, having attended the Union University at Murfreesboro from 1868 to 1872, and Davidson College, N. C., from 1872 to 1875. In July, 1875, he commenced the study of medicine with Dr. J. E. and Robert Wendell of Murfreesboro. He attended lectures at the Louisville Medical College in winter of 1876-77 and summer of 1877, and in Cincinnati, Ohio, in the winter of 1877-78, graduating M.D. in the spring of this year. Immediately upon leaving college he settled to practise in Chattanooga, Tennessee. When the yellow fever appeared there it found him anxious for business and not at all deterred by the reports of the mortality attending it in the cities farther south.

He was a man of good habits, vigorous health, refined in his tastes, and very genteel in his appearance, and was rapidly establishing for himself a position in society, and being known as a physician. From the introduction of the fever into Chattanooga the doctors were all kept busy. On the 7th of October he was stricken with the disease and died in six days. His remains are interred in the City Cemetery, Chattanooga.

J. M. T.

BALL, C. W., of New Orleans, Louisiana. Died at Grand Junction, Tennessee, 1878.

BANKSMITH, R. H. Died Court St., Memphis, Sept. 17, 1878.

BANKSON, J. S., of Stevenson, Alabama. Died at Memphis, Tennessee, September 18, 1878.

BARBER, L. E. Died at Vicksburg, Miss., 1878.

BARNS, THOMAS P. Died at Hickman, Ky., Sept. 21, 1878.

BARR, ROBERT NELSON, M.D., was born in Columbus, the seat of government of the State of Ohio, October 27, 1832; died at Chattanooga, Tennessee, October 13, 1878. He was the son of John and Nancy (Nelson) Barr, well-to-do farmers in Franklin County, Ohio.

His education was at the public schools in Columbus, and when sufficiently advanced he was sent to the East Tennessee University, where he completed his academical course.

Having chosen medicine for his profession he selected an able instructor, and after remaining for a year attended lectures at the Starling Medical College, where he graduated M.D. in 1854. He wrote his thesis upon yellow fever. The study of the history and treatment of this disease had throughout his professional career a special fascination for him. Perhaps this may have had something to do with his volunteering his services and going to the city of Chattanooga when the fever broke out in that place.

Dr. Barr commenced to practise in Columbus directly after obtaining his medical degree; on the breaking out of the war he was appointed Surgeon of the 36th Ohio regiment; February 26, 1862, he resigned to accept the surgeoncy of the 87th regi-

ment of Ohio volunteers, and served the term of enlistment. He then served as Post Surgeon at Camp Chase, and then was commissioned Surgeon-General of the State of Ohio.

The Doctor also held other positions of honor in the profession to which he was elected by his brethren. I will instance that of Professor of Anatomy in Charity Hospital College, Cleveland, Ohio. He was a member of the Hamilton County Medical Society, Chattanooga, Tennessee.

After the close of the war he engaged in planting in Monroe County, Alabama, which he continued for four years. During this time he was elected to the Alabama State Senate, in which he served with credit. In 1871 he removed to Chattanooga and resumed the practice of his profession, which he conducted with increasing reputation to the time of his death. Dr. Barr was married and leaves a widow. His remains are interred in the National Cemetery at Chattanooga, Tennessee.

Data furnished by Dr. J. H. Van Deman.

J. M. T.

BARTHOLOMEW, ORLANDO D., M.D., of Nashville, Tennessee, was born in Jackson, Tennessee; died at Memphis, Tennessee, October 8, 1878. He graduated with distinction in medicine from the University of Nashville in 1876.

Shortly after he settled to practise in Nashville, and was gradually working his way to a successful business. At the outbreak of the yellow fever, or rather when it became alarming at Memphis, he volunteered his services to the Howard Association, and, being accepted, was at once assigned to duty in the midst of the distemper. He left a lucrative and respectable business for this scene of duty.

After six weeks of faithful and acceptable services he was stricken down with the disease which he went to save others from. In addition to his professional duties he had rendered valuable services as a telegraph operator when that service could hardly get an efficient operator for love or money.

The Western Union Telegraph Company held a meeting Oct. 20, 1878, at which a series of resolutions were adopted highly eulogistic of the Doctor and his services to the company, which they directed to be published in the Journal of the Telegraph and in the Nashville Journal of Medicine.

The data of this sketch are taken from the latter.

J. M. T.

BEATTY, J. H., of Mobile, Ala. Died at Grand Junction, Tennessee, 1878.

BIRDSONG, GEO. T. Died at Vicksburg, Miss., Oct. 7, 1878.

BLICHFELDT, M. Died at Vicksburg, Miss., Oct. 12, 1878.

BLACKMAN, M. C., M.D., of Davidson County, Tenn., died at Vicksburg, Miss., Oct. 7, 1878. He was a graduate of the University of Nashville and Vanderbilt University in 1878. The Doctor was associated in practice with his father, Dr. W. G. Blackman, in Davidson County, near Nashville, but volunteered his services to Vicksburg. A brief period only was allotted him, as he fell a victim to that terrible epidemic and added another name to the heroic list of martyrs to professional duty. He possessed in a high degree the attributes of a gentleman, and gave promise of much usefulness and a brilliant future.

J. M. T.

BLANTON, CARTER, M.D., was born in Owen County, Ky., Nov. 5, 1829; died at Hickman, Ky., Sept. 13, 1878. He was the son of Henry and Mrs. (Green) Blanton, farmers.

The subject of this sketch selected medicine as a pursuit in life, and became an office pupil of Dr. Martin. He attended lectures at the Ohio Medical College at Cincinnati, and graduated M.D. in 1852. Ten years later he attended a course of lectures at Philadelphia. The same year he began to practise in Dresden, Tennessee, where he resided about four years. In 1856 he removed to Hickman, Ky., where he was actively engaged in a general practice up to the time of his death. He was a man industrious and painstaking, of temperate habits, gentle disposition, always in good health, and a welcome visitor to every house where there was sickness. In 1852 Dr. Blanton was united in marriage to Miss Katie Anderson, who lived but about a year and a half after. He did not again marry, and died without leaving children. His remains are interred in the Hickman Cemetery.

J. M. T.

BOAZ, CRISPIN D., M.D., was born in Virginia, July 10, 1827; died at Fulton, Ky., Sept. 21, 1878. He was the son of David R. and Susan W. Boaz. He is said to have studied medicine with a Dr. Hamilton in his native State.

He obtained a medical degree from the University of Virginia in 1849, and subsequently another doctorate from the Medical Department of the University of Louisville in 1852. Dr. Boaz seems to have been anxious to keep abreast with the leaders in medical thought, for he is reported to have attended a course of lectures at the University of Pennsylvania in 1857. In 1858 he was united in marriage to Miss Susan Oury. In 1863 he removed to Fulton, Ky., and at once secured a good patronage. He was an untiring, conscientious, tender physician, feeling deeply for his patients, and recognizing fully his own responsibility.

In stature he was tall and erect, with black hair and dark eyes, nervous temperament, and modest, gentlemanly bearing. He was a member of the Knights of Honor brotherhood, and of the Southwestern Kentucky Medical Association. He leaves a son and daughter to mourn his loss.

Data from memorial sketches by Dr. J. W. Singleton, read before the Southwestern Kentucky Medical Association.

J. M. T.

BOBA, BURWELL A., of Georgia. Died at Memphis Oct. 3, 1878.

BOND, T. W., of Brownsville, Tenn. Died at Memphis Sept. 16, 1878.

BONNER, CHARLES. Died at Holly Springs, Miss., 1878.

BOOTH, DAVID WINFIELD. For sketch see Necrological Report.

BOYD, JAMES GREEN, M.D., of Milan, Tenn., born in Pittsylvania County, Va., in 1821 or '22; died of what was supposed to be yellow fever at his residence in Milan, Tenn., Sept. 22, 1878. He was the son of George and Martha R. (Hunt) Boyd, successful farmers in Virginia. Having prepared himself for the study of a profession by the acquirement of a liberal education, he selected medicine, and chose for his preceptor Dr. David H. Boyd. He attended lectures and graduated M.D. at the Transylvania University, Lexington, Ky., in 1847. His thesis was on "Sulfate de Quinia." The same year he opened an office and began practice at Shady Grove, Gibson County, Tenn. For nineteen years he labored successfully and acceptably at this point, but in 1866 he was induced to remove to the neighboring town

of Milan, Tenn., where he enjoyed a large general practice to the time of his death. He was a man of large frame, six feet two inches in height, sound physique, regular and temperate in his habits, capable of performing a vast amount of professional labor. The Doctor possessed a taste for reading, social intercourse, and the culture of refined society. He was a consistent member of the Presbyterian Church, and highly respected by the whole community.

Dr. Boyd was twice married—first in 1846 to Nancy Kuykendall, daughter of John C. Kuykendall, by whom he had one daughter, now the wife of Lieut. W. A. Miller, U. S. A. His second wife was Nina Alexander, daughter of James Alexander. She died in less than twenty-four hours after the Doctor, of the prevailing epidemic, on the 23d of September, 1878. The remains of the Doctor and his faithful wife were later interred at Oakwood Cemetery beside each other at the same time. I will close this brief sketch by a quotation from a notice of the Doctor published in the *Milan Exchange* of September 26, 1878:

“He was the friend of every one; the poor were his flock; the needy never left his door unfed; the afflicted found a comforter; and to friend and stranger his practice, his time, and his medicine were almost gratuitous. He was liberal to a fault. Careless of his own pecuniary interests, he lived the life of the poor in his old age. His life was devoted to the healing of the sick. To our people, knowing him as they did, his memory is something to be loved, honored, and cherished. If purity of daily life; if unostentatious charities; if love for his fellows shall count for aught in that life beyond to which he has gone, his future is not void of that reward promised by Him who has said, ‘the greatest of these is charity.’ ”

J. M. T.

BROADSING, —. Died at Beachland, Tennessee, 1878.

BROWN, R. F., Secretary Board of Health of Memphis. Died at Memphis, October 8, 1878.

BRUMLEY, —. Died at Port Gibson, Miss., 1878.

BURCHAM, ROBERT, Columbus, Ohio. An English physician, had been in the East India service. Died at Memphis, Sept. 25, 1878.

BURROWS, —. Died at Main Street, Memphis, Tenn., Sept. 25, 1878.

BYRNE, J. G. Died at New Orleans, La., Sept. 2, 1878.

CAGE, A. H. Died at Canton, Miss., Sept. 18, 1878. Was a member of the Mississippi State Medical Society.

CARTER, W. W. Died at Tangipahoa, La., Sept. 15, 1878?

CATLETT, HENRY C., M.D., was born in Frederick County, Va., in 1812; died at Hickman, Kentucky, September 16, 1878. He was the son of George and Letitia Catlett, who removed from Virginia to Kentucky during his childhood. The Doctor, therefore, grew up and received his education chiefly in the University of that State. Dr. Catlett attended a course of lectures at the college in Louisville during the early days of medical teaching there.

He began to practise at Hickman, Kentucky, in 1848, and acquired and retained a good business. He was largely a self-made man, and possessed a wide range of general and scientific knowledge. An extensive reader and close observer, of good habits, and an exemplary Christian, and a consistent member of the Baptist Church.

During his early professional life he was united in marriage to Mary E., daughter of Peter C. Buck, Esq., of Montgomery County, Tennessee. She died some years since, leaving no children. The Doctor, however, adopted a little girl as daughter, who is now Mrs. Annie Holmes, of Hickman, whom he treated as his own, and she in a most affectionate and exemplary manner returned the devotion due to a parent. The Doctor was a member of the Kentucky State Medical Society.

Data from memorial sketches by J. W. Singleton, read before Kentucky State Medical Association in 1879.

J. M. T.

CHEVIS, LANGDON A., of Savannah, Georgia. Died at Memphis, Tenn., Sept. 25, 1878. His father was Col. Langdon Chevis, of Charleston, S. C. He assisted in making many post-mortem examinations. He was an expert with the microscope, to which he submitted the tissues, dejections, etc. of many patients, and was collecting material that, had life been spared him, would have

been carefully worked into a report upon yellow fever. Dr. Chevis had made many warm friends among the physicians and citizens of Memphis.

COMPTON, WM. McC. For sketch, see Report.

CONE, WM. C. Died at Franklin, Tennessee, Sept. 10, 1878.

COOKE, JOHN LOY, M.D., of Henderson, Kentucky, was born in Russell County, July 3, 1838; died at Hickman, Kentucky, October 1, 1878.

He graduated in medicine at the University of Louisville, Ky., in 1867, and at Bellevue Hospital Medical College, New York, in 1870. He began to practise at Rowena, removed to Jamestown, then to Shepardsville, and finally took up his residence at Henderson, Kentucky.

He was a member of the Henderson Medical Club, and was its president. A member of the Kentucky State Medical Society, and the McDowell Medical Society; chairman of Board of Medical Examiners of the third judicial district of Kentucky. He had commenced the study of medicine and was well advanced before he entered the Confederate army, in which he served with Morgan, and was captured in Ohio and held prisoner at Camp Douglas. Here he served his companions as surgeon for twenty months.

In May, 1871, he was united in marriage to Annie B., daughter of J. P. Oldham, Esq., of Elizabeth, Kentucky.

Dr. Cooke, although comparatively young in the profession, has contributed some very thoughtful and valuable papers. I find the following mentioned in the sketch of him in the "Physicians and Surgeons of the United States":—

Cerebro-Spinal Meningitis. Richmond and Louisville Medical Journal, July, 1872, and on same subject in that Journal for November, 1873.

Remittent Fever and Congestion of the Brain. Philadelphia Medical and Surgical Reporter.

Sthelosis. American Practitioner, August, 1875.

Curable and Incurable Diseases. Virginia Medical Monthly, Sept., 1875.

Phthisis Pulmonalis. Transactions of McDowell Medical Society, 1874.

Asthma. Louisville Medical News.

That the paper of Jurgensen in Ziemssen on Catarrhal Pneumonia really refers to Capillary Bronchitis. Transactions Kentucky State Medical Society, 1876.

Slow and Deep Breathing a Remedy for Wakefulness. Louisville Medical News, October, 1876.

Physiological Therapeutics in Fever. Transactions Kentucky State Medical Society, 1877.

Germes in Diphtheria. American Practitioner, September, 1877.

Aborting Diseases. Transactions McDowell Medical Society, 1876.

J. M. T.

CORBETT, WILLIAM D., M.D., was born in Sumner County, Tenn., October 14, 1829; died at Hickman, Ky., October 10, 1878. He was the son of Joseph Corbett, Esq., of Tennessee. His academic education was obtained at an academy in the vicinity of his home. His medical studies were pursued under the direction of Dr. B. W. Lauderdale, of Paris, Tenn. He began practice in Logan County, near Russellville, Ky., in 1853.

In 1854 he was united in marriage to Miss Rebecca Ann Terry of his native State. In 1865 he removed to Hickman. He was beloved as a man and enjoyed the confidence of his brother physicians, and had a large and responsible practice.

He was a member of the Christian church, and also a member of the Masonic fraternity. Was a member of the Southwestern Kentucky Medical Association.

Data from memorial sketches by Dr. J. W. Singleton, read before the Southwestern Kentucky Medical Association.

J. M. T.

CUSHMAN, —. Died at Warren County, Miss., 1878.

DAMERAN, P. Died at Thibodeaux, La.

DAVIS, H. C. At Quarantine Hospital, St. Louis, Nov., 1878.

DAWSON, G. R., Memphis. Died at Memphis, Oct. 24, 1878.

DE MERRILL, —. Died at Point-à-la-Hache, La., Oct. 10, 1878.

DICKERSON, P. M. Died at Memphis, September 14, 1878?

DICKSON, George, M.D., died at Dry Grove, near Crystal Springs, Mississippi, October 5, 1878. He was a native of that section, and having studied his profession, settled among his kindred to practise.

When the epidemic became alarming, he maintained his post, and although acclimated, yet from overwork and exposure he was soon attacked and perished in the morning of life. The labors he had performed gave promise of a brilliant future, had he lived.

J. M. T.

DOBBINS, A. M. C. Died at Williston, Tennessee, 1878.

DUPREZ, —. Died at Tuscumbia, Ala., 1878.

EASLEY, EDWARD TANDY. For sketch of, see regular Report.

ERSKINE, JOHN H., Memphis. Was health officer. Died at Memphis, Tennessee, October 17, 1878.

EWELL, A. C., Memphis. Had been absent much of the time, but, on returning about the last of October, was attacked with yellow fever, and died November 3, 1878.

FARIS, JAMES WHITE, M.D., was born in Mississippi County, Mo., March 8, 1844; died at Hickman, Ky., September 27, 1878. He was the son of Richard and Ethalinda (Harris) Faris, respectable families in the State of Missouri. His academical education was obtained at the schools in the vicinity of his home, and at the Hickman Academy.

His medical studies were pursued under the supervision of his brother, Dr. Alexis A. Faris, who was and still is one of the leading practitioners at Hickman, Ky. Having made sufficient progress in his studies, he attended two full courses of lectures at the University of Nashville, Tenn., and graduated M.D. in 1874.

After remaining a short time in practice with his brother at Hickman, he returned to the county of his birth in Missouri, where he entered upon general practice, and had met with encouragement and success. His business had been large and responsible, and was only limited by his strength and power of endurance.

He was not married, was a man of mild but firm character, blue eyes, light hair, stature erect, weight about one hundred and thirty pounds, of pleasant manners, and popular with his patients and all who knew him.

When he heard the yellow fever had become epidemic at Hickman, and that his brother was ill, he instantly started to his relief, and tendered his services to the people of that afflicted town. He was indefatigable in his attentions to his brother, and also attended to his patients, many of whom were his personal friends, until stricken down by the fell destroyer. A noble example of brotherly attachment and devotion to professional

duty. This notice will be appropriately concluded by a quotation from an editorial in the *Hickman Courier* of Nov. 15, 1878:

"Perhaps the noblest death in the dread record of these terrific times was that of Dr. James W. Faris. He was in Missouri, beyond the reach of danger. His brother, Dr. A. A. Faris, was sick—broken down. He left safety and came voluntarily into the midst of death to take his stricken brother's place. He appealed to Dr. Blackburn and others to compel his brother to leave—pointing to the fact that his brother was already sick, that he had a wife and children to suffer by his death, while 'I have none; no one is dependent upon me. If I fall, it will be as the falling of a drop of water in a grand and mighty river, at once lost and soon forgotten.' He stood at his post about two weeks, when the fatal fangs of the fiery dragon snapped his young life. To use the words of this noble young man, he had 'no one dependent on him,' but the hearts of all who love the good and noble will never cease to pay tribute to the memory of his name."

J. M. T.

FENNEL, FRANK, M. Died near Holly Springs, Miss., October 1, 1878, almost neglected, his brother, Dr. William, attending and nursing him without one other person, and alone buried him in the night.

From "Heroes, Honors, and Horrors of the Yellow Fever of 1878."

J. M. T.

FENNEL, WILLIAM, M.D., died near Holly Springs, Miss., October 5, 1878. His remains were brought to Holly Springs, Miss., a few days after his brother had been buried.

From "Heroes, Honors, and Horrors of the Yellow Fever in 1878."

J. M. T.

FENO, —. Died at Vicksburg, Miss., 1878.

FERRISS, —. Died at Warren Co., Miss., 1878.

FITZGERALD, PETER FLETCHER, M.D., was born in Smithville, Brunswick County, N. C., November 2, 1836; died at his residence, a few miles southwest of Grenada, Grenada County, Miss., October 13, 1878. His father was the Rev. Edward James Fitz-

gerald, of the Methodist Church. His mother was Sarah Ann, daughter of Peter and Sarah (Goodman) Gause.

The subject of this notice received a good academic education. Having studied medicine, he attended his first course of lectures at the Nashville Medical College, Tenn. His second was at the University of Louisiana, where he graduated M.D. in 1858. Shortly after obtaining his degree, he commenced practice in Carroll County, Miss.; then he moved to Tallahatchie County, where he remained about two years. Returned to Carroll County, and from thence moved to Grenada, when he became profitably located and enjoyed a good business.

The Doctor served as an assistant surgeon in Forrest's command in the Confederacy. Although enjoying fair health, he was never robust; in height he was about five feet nine inches, weighed one hundred and twenty-five pounds, fair complexion, light hair, blue eyes; was regular in his habits, and was a consistent member of the Methodist Church. He was also a member of the Masonic fraternity, and Master of the Grand Council Lodge, and was in affiliation with the Workingmen's Association. He was at the time of his death president of the Board of Health of Grenada.

Dr. Fitzgerald was twice married, first to Alice Purnell, and secondly to her sister Helen. No child by either.

As soon as it was absolutely known there was yellow fever in Grenada, Dr. Fitzgerald went to town and tendered his professional aid. His professional brothers of that place, however, with a disinterestedness almost without parallel, urged him to hasten from the stricken town, and hold himself in readiness to assist the people in the country.

He returned to the country, and there discharged his various professional duties. Some time in September the fever made its appearance in his neighborhood. Without hesitation and with unflinching courage, he sought night and day to alleviate the intense suffering of his neighbors and friends.

At the bedside of Dr. Fielder, a neighboring physician, he was stricken down with the disease; he was carried to his home, when, after a few days of patient suffering, he yielded up his blameless life.

He was extremely modest, unpretending, and amiable. His fund of wit and humor was pure, rich, and inexhaustible. He

had the most implicit confidence in those whom he regarded as his friends, and bore malice towards no one.

Data furnished by Dr. L. L. Saunders.

J. M. T.

FORBES, J. A., Round Rock, Ark. Died at Memphis, Sept. 24, 1878.

FORCE, H. F., Hot Springs, Ark. Died at Memphis, Oct. 13, 1878.

FORD, E. C. Died at Summerville, Tenn., 1878.

GADDIS, —. Died at his residence in Washington Co., Miss., 1878.

GALLAGHER, CHARLES, M.D., a native of Louisiana, died in New Orleans, Sept. 7, 1878. He received a good academical education, and then took up the study of medicine, and was an interne student in Charity Hospital, New Orleans, for a year or more. He attended lectures at the University of Louisiana, from which he received the degree of M.D.

Being ambitious to acquire still further knowledge of his profession, he went to Europe, where he spent some five years in assiduous prosecution of professional studies in the various institutions for obtaining special medical information. Returning home, he began practice in his native place, and was gradually obtaining employment when the epidemic of yellow fever of 1878 broke out. His enthusiasm led him to overwork. At this stage he was advised to retire and rest, but he could not be prevailed upon to intermit his labors for even a whole night. A week before he died he confessed to some friends that he expected he should take the fever and die, but that even with this belief he could not desert the post of duty which as a physician he had assumed.

Data from Dr. S. M. Bemiss.

J. M. T.

GARVIN, J. G. Died at Williston, Tenn., 1878.

GERDIN, ALBINUS, M.D., was born in Lowndes County, Miss., June 22, 1848; died Sept. 28, 1878, near his residence in Arcola, Washington Co., Miss. He was a graduate in medicine from

the University of Louisiana, in the class of 1868. Shortly after obtaining his degree, he settled to practise in Arcola, Miss., where, by his assiduous attention, he had acquired a remunerative employment.

He was married. A wife and infant child of three months survive him. The Doctor was attacked with the fever while attending a neighboring brother physician, Dr. Gaddis, and was unable to return to his own home. His remains were interred in the grounds of Dr. Gaddis, who subsequently died of yellow fever, and was buried by the side of Dr. Gerdin.

J. M. T.

GILLAND, S. W. Died at Vicksburg, Miss., Nov. 2, 1878.

GILLESPIE, —. Died at Grenada, Miss., Sept. 14, 1878.

GLASS, —. A volunteer physician, died at Vicksburg, Miss., Oct. 13, 1878.

GODMAN, H. R. Died at Terry, Miss., 1878.

GORRELL, J. G. O., Fort Wayne, Ind. Died at Memphis, Tenn., April 21, 1878.

GOTTHELF, B. H. Died at Warren Co., Miss., 1878.

GRAY, —. Died at Lagrange, Tenn., 1878.

GRIFFIN, —. Died near Greenville, Miss., 1878.

GRIGSBY, J. P., of Erin, Tenn. Died at Erin, Tenn., Oct. 8, 1878?

GUNTACH, —, St. Louis, Mo. Died at Brownsville, Tenn., Oct. 18, 1878.

HALL, WILLIAM WOOD, M.D., the subject of this sketch, was born in Yalabusha County, Mississippi, August 17th, 1839; died at his residence in Grenada, August 27th, 1878.

His father, James Gatlin Hall, was a Baptist minister, who removed to Mississippi in 1837, residing in and near Grenada from that time until the day of his death (from yellow fever), Sept. 1st, 1878. His mother's maiden name was Elizabeth Sarah Wood, daughter of William Wood and Ann Granberry, his wife, of Perquimons County, N. C.

This family of Halls were of English extraction, and came to America in early colonial days, settling first about New London, Connecticut. Younger members of the family went thence to Pennsylvania, and still later to Maryland, and from the latter State, Spence Hall, about 1740, removed to North Carolina, and settled in Currituck County. He was the great-grandfather of Dr. Hall, and had two sons, one of whom, also named Spence (the grandfather of Dr. Hall), continued to reside in Currituck County to the date of his death, except while with the Continental army (in which he served through the Revolution), and while at sea, a life which he followed for some years after peace was declared, amassing thereby a handsome estate, and becoming the owner of more than one merchant vessel. After leaving the sea, he became quite prominent and influential in his section of country, serving many years in the North Carolina Assembly, first in the House of Commons (as it was then called), and afterwards, and until his death, in the Senate. He married Mary Gatlin, by whom he had several children, the third son being James Guthrie Hall, the father of Dr. Hall. When Rev. James G. Hall settled in Mississippi, it was but sparsely populated, and but little developed. In the exercise of his vocation as a minister, and by his blameless life, he wielded for many years a wide influence, and when aged and infirm, had the respect, confidence, and love of a wide circle of friends.

The Woods, Dr. Hall's maternal ancestors, were of Scotch blood. James Wood, his maternal great-grandfather, was an early settler of North Carolina, and when past middle age served as an officer in the Continental army. He lived to a vigorous old age, surviving most of his children. William Wood (grandfather of Dr. Hall) was the fifth son of James Wood. He married Ann Granberry (whose father was also a revolutionary officer), by whom he had three children, the second of whom was Elizabeth, the mother of Dr. Hall. He died when about forty years of age. Dr. Hall's ancestry may therefore be set down in regular order, so far as this brief sketch will allow, thus: father, James Gatlin Hall; paternal grandfather, Spence Hall; paternal great-grandfather, Spence Hall, Sr.; mother, Elizabeth Sarah Wood (Hall); maternal grandfather, William Wood; maternal great-grandfather, James Wood.

Dr. Hall received his education mostly at the Masonic Academy, Grenada, Miss. He was deterred from taking a regular

collegiate course by the financial misfortunes of his father, who was for many years a man of considerable property, but lost most of his estate by becoming surety for his friends. But after leaving school, he continued his studies until he became not only well grounded in an English education, but quite proficient in the classics. He began reading medicine under the excellent supervision of the lamented Dr. E. W. Hughes, in 1857, attended his first course of lectures at the University of Nashville, in the winter of 1858-59, and a second course at the same institution in the winter of 1859-60, receiving his M.D. degree in March, 1860. Drs. Eve and Bowling were among the professors of the Nashville University at the time, but the writer cannot recall any of the other professors' names, nor does he know the subject of Dr. Hall's thesis.

He began practice in the summer of 1860, in Tallahatchie County, Miss., and remained there until August, 1861, when he gave up his practice to enter the Confederate army. Being badly wounded at the battle of Chickamauga, he was transferred to the medical department, with the rank of assistant surgeon. He was afterwards made full surgeon, and in that capacity given charge first of a regiment, and afterwards of a brigade, and served till the close of the war. He then located at Coffeeville, Miss., where, however, he only remained for about a year, and then returned to Grenada, Miss., at which point he continued to reside and practise up to the date of his last illness.

At Grenada he soon began to do a considerable practice, and at the time of his death it had become very extensive, and with a less generous and kindly man, or one more careful of his own pecuniary interests, it would have been a very lucrative practice. As a physician his ability was unquestioned, and as a surgeon his reputation was of a high order and firmly established. He was especially fond of surgery, being a skilful and bold, but never reckless, operator; and being rewarded with success in many difficult cases, his name was rapidly becoming known, at the time of his death, throughout the State for his attainments in this branch of his profession. He was also very skilful in treating diseases of females, to which specialty he gave much attention.

I cannot pretend to give even an imperfect list of his professional writings, many of which were never published. He contributed many papers to the Grenada County Medical Society,

several to medical journals, and to the State Medical Association of Mississippi. Among the latter, two successive reports on the "Surgical History of Mississippi" attracted the attention of the profession throughout the State, and were highly commended. Among his papers, after death, were found a great number of notes of cases that he had treated or been consulted about. They indicate how carefully he treasured everything likely to aid him in his profession, or to benefit the fraternity of which he was a devoted fellow.

With the exception of being a lieutenant and afterwards captain in the Confederate army (until wounded at Chickamauga), the writer does not know of his ever having held any office not connected with his profession. After the Chickamauga fight he was assistant, and afterwards full surgeon in the Confederate army. He was successively a member of the Grenada County Medical Society, and member of the Grenada Board of Health. Upon the organization of the Memphis (Tenn.) Hospital Medical College, in 1878, he was tendered the position of Professor of Gynæcology, which he accepted, with the intention of beginning his duties in that place in the autumn of the year; but the persuasions of friends, who thought it unwise for him to leave a field where he had already achieved great success and had the prospect of still further usefulness and honor, induced him to reconsider his acceptance, and to decline the chair proffered him. Before the autumn came he had fallen in the discharge of duty to a stricken and dying people. He was a member of the Masonic fraternity, of the Knights of Honor, and of the Ancient Order of United Workingmen, besides being connected with the Grenada County and State Medical Associations.

He usually enjoyed excellent health, though of late years he had suffered somewhat from hernia. His habits were exceedingly temperate in all respects, and as regular as the active duties of his profession would admit. He was about five feet eleven inches in height, of robust form, had dark eyes and hair, and a frank and pleasant face, which indicated also strong mental power. He was considered a very handsome man, and had strong personal magnetism. He was inclined to be literary in his tastes, and was especially studious in everything connected with his profession. Yet he was fond of social intercourse, and enjoyed greatly the society of his friends, especially those of his

own profession. His general character was of the most unblemished purity and integrity. He was for many years a consistent member of the Baptist Church. His benevolence and his charity to the poor and distressed were as boundless as his means or his opportunity would admit. To this sketch I attach as an appendix a copy of a memorandum written on the fly-leaf of one of his books of account. It feelingly expresses both the natural kindness of his heart and the lofty sentiments animating him as to his profession. It is safe to say that at no moment of his life were his characteristics in the respects mentioned lowered or changed in the slightest degree.

The yellow fever epidemic of 1878, at Grenada, found him at his post. How faithfully he labored, how much he suffered, how heroically he died, cannot be well told here. On the day the fever was declared epidemic (August 11, 1878) one of his dearly loved brothers was stricken and died in a few days. Next the children of a sister were stricken, then his only two sisters, his wife, and his aged parents. In the midst of all this woe he went day and night, not only among his own suffering and dying loved ones, but through the doomed and dying people of the town until, as he wrote, he could "scarcely drag one weary foot after the other."

A few extracts from a letter written by him on the 16th of August will give some idea of what he endured and how he felt. He says: "I am working night and day trying to do something for our stricken people, but all our efforts seem unavailing. I have never been so nearly heartbroken. We rest under the very shadow of death. The people are in despair. Nothing but sickness and death meet us on every hand. . . . I never heard of such an epidemic. We have not, so far, a single perfect recovery. To take the disease is to die." Then, after referring in the saddest and most touching manner to the death of his brother and the illness of other loved ones, he proceeds: "I will stand by the family and my people while life lasts. If taken away, it is all right. I think I can meet death with courage and hope; but I do pray to be spared to my family and my people until the danger is past. If I die, I must; I only pray God to spare me until the epidemic is over, that I may do all I can to minister some comfort to his afflicted creatures. I have so far done little else than smooth their final passage to the grave; but God knows how hard I have tried.

"I try to be courageous and to hope. I have no fears for myself. If the offering of my life would stay this fearful pestilence, how gladly would I lay it down!"

But it was decreed that his life should be offered, and, as it seemed, in vain. On the 25th of August, 1878, he was stricken with the fever, and died on the 29th of August, aged 39 years. A brother, a sister, two nephews, and his wife just preceded him to the grave. His father, mother, and youngest brother followed him within three days after his death. He was buried in the Odd Fellows' Cemetery at Grenada.

The various societies to which he belonged paid fitting tributes to his memory, when the epidemic was over, as did the county and State medical associations of which he was a member; but the writer has not these tributes at hand and cannot quote them. Dr. Hall left surviving him, besides the children of his sisters, and his near relatives, only one brother, James G. Hall, Jr., of Sardis, Mississippi, and one sister, Mrs. Eliza L. Hamilton, of Grenada, Mississippi.

Dr. Hall was married to Mary Caroline Koen, daughter of Dr. John Koen, of Collierville, Tennessee, on the 14th day of Aug., 1861. They had no children, and she preceded her husband to the grave by two days, dying in Grenada, of yellow fever, August 27, 1878.

He left only a small estate at his death. He might easily have accumulated a considerable sum from his practice had he given his collections close attention. But he was ever loth to ask any one for money, and from the really needy he would not receive it. Besides this, his engrossment in his profession made him careless of the details of business, and his liberal disposition led him to share what he had with those he believed to be in necessity.

The information above is given by the only brother of the deceased, and is compiled from family records and papers, and from his own knowledge.

APPENDIX.

Copy of a "Request" found on the fly-leaf of one of the books of account of the late Dr. W. W. Hall.

When I die and my business passes into other hands for settlement, it is my earnest request that the *poor*, particularly the *widow and orphan*, be shown as much leniency as the interest of my creditors and the wants of my family will permit. Where I have opened accounts, I have endeavored to guard against mistakes, and to deal fairly with my patrons; and at the same time scrupulously

avoided taking any unprofessional advantage, such as undercharging brother physicians, etc. It has ever been my desire to *elevate* the standard of medicine; and, if I have done nothing to promote, I trust I have done nothing to prostitute, the profession I have loved so well—the practice of which (though it has often brought grief and tears to every conscientious disciple) has had a softening and refining influence over my feelings, and given me happiness which no other profession could. I have practised, not for filthy lucre, but from a desire to alleviate the sufferings of humanity; not because I love the responsibilities, or the dark pictures, which meet me on every side, but because I feel that it is my duty. In truth, *I cannot help it*.

W. W. HALL.

HARLAN, L. B., Hot Springs, Ark. Died at Memphis Sept. 16, 1878.

HARRIS, EDWARD W. Died at Sumnerville, Tenn., 1878.

HAWKINS, —. Died at Grenada, Miss., Aug. 19, 1878.

HAYES, R. T. D. Died at Vicksburg, Miss., Sept. 28, 1878.

HEADY, T., Sherman, Texas. Died at Memphis, Tenn., Sept. 22, 1878.

HEATH, —. Died at Angola, La., Oct. 20, 1878.

HERNDON, CHARLES L. CUVIER, M.D., was born in Barboursville, Knox County, Ky., December 5, 1833; died at New Orleans September 12, 1878. He was the son of Dr. John Wade Herndon, born in Barboursville, who removed to Clinton, Ky., where he practised from 1826 to 1836. The mother of the subject of this sketch was Susan, daughter of Judge Randolph Adams, of Knox County. His paternal grandfather was Richard Herndon, who married Nancy Hogan. His maternal grandfather was Randolph Adams, who married Sarah Herndon. His ancestors on both sides were early emigrants to Knox County from Virginia, and were during their lives prominent and influential citizens in that section.

Dr. Herndon received a good academical education. His medical studies were commenced about 1855, and prosecuted under the supervision of Dr. Wm. J. Heddens, now of St. Joseph, Mo. The subject of this notice attended lectures at Jefferson Medical College, where he graduated M.D. in 1858. Nine years after this he attended a course and graduated at Bellevue Hospital

Medical College, New York. In 1858 he began practice in Barboursville and continued until the breaking out of the late war. His enthusiasm led him to enlist as a private in the 7th Kentucky U. S. Volunteer Infantry, and for some time he served as hospital steward. He was then commissioned assistant surgeon to same regiment, and was mustered out October 5, 1864; he was then commissioned surgeon of the 21st Infantry of Kentucky, on March 29, 1865, serving until the close of the war, and was mustered out in December, 1865. Dr. Herndon then settled at Gallatin, Daviess County, Mo., but, determining to attend another course of lectures at Bellevue Medical College, went there for a winter. Returning to Kentucky, he located at Lexington, and was also employed in a clerical position in the Pension Office until his marriage in the year 1873. Shortly after this he removed to New Orleans, La. Part of the time he held position as Government Storekeeper. He at the same time did some practice, which was steadily growing toward a supporting business. He was well posted in the theory and practice of medicine, and had had much hospital experience, and was acknowledged by his associates as a well-informed, skilful, and judicious practitioner. He was elected quarantine physician by the New Orleans Board of Health in 1876, and again in 1877, serving from July 1st to Oct. 21st, a duty which he discharged with ability. Dr. Herndon in the spring of 1878 was elected Prof. of Physiology in the Medical Department of New Orleans University. His first term of lectures was to have begun about the time of his death. He was a man of industrious habits, punctual in all his professional engagements, and was devoted to his profession and to the acquirement of knowledge. His habits were regular, a great reader of the best medical literature, and careful of his conduct and deportment to the humblest. To his friends he was genial, and to his family tender and devoted. On the yellow fever becoming epidemic in New Orleans he sent his wife and two children to friends in Kentucky, and was the first physician to tender his services to the organization of the Young Men's Christian Association. He was accepted, and entered at once actively and laboriously upon the duties assigned to him. He was too unmindful of self, and becoming weakened and fatigued, he was soon attacked with the disease, against which he had hoped himself sufficiently acclimated. After a brief illness, commencing on the 7th of September, he died on the 12th of the same month.

The day he was taken sick he visited eighty patients. He received every attention from the Young Men's Christian Association during his sickness. His remains were decently interred in Washington Cemetery. His funeral sermon, of great power, was preached by Rev. Dr. Palmer.

Dr. Herndon was united in marriage November 25, 1873, to Everlee, daughter of Elisha Craven and his wife, America (Kearby). They had two children—Georgia Charlotte, born Nov. 22, 1874, and Everlee, born Aug. 16, 1877.

Resolutions of respect to Dr. Herndon's memory and for his efficient services were passed by the Young Men's Christian Association and signed by the President, W. T. Hardie, and published in the city papers. He is also honorably mentioned in the report of the relief workers published by this Society in 1879.

From data furnished by T. Randolph Herndon.

J. M. T.

HICKS, JOHN B., M.D., was born in the city of Vicksburg, Mississippi, November 18, 1839; died in Alabama, where he had gone broken down with his professional labors in the late epidemic, October 7, 1878.

He was a man of fine culture, and received his medical degree at the University of Louisiana in 1861, on which occasion he was the valedictorian of his class. On leaving college he entered the army of Virginia as a surgeon. In 1862 he was transferred to the department of the Mississippi, serving as surgeon to the close of the war. In 1865 he was united in marriage to Miss Ida Young. After the war Dr. Hicks located in his native city, and soon had his time fully occupied in professional business. For some time he had charge of the city hospital. The excessive labors thrown upon the profession by the epidemic rapidly broke down the health and vigor of most of the physicians. In an enfeebled state the Doctor left the city when he was no longer able to attend to business, but he carried with him the poison which in a few days caused his death.

From advance sheets of the Transactions of the Mississippi State Medical Association.

J. M. T.

HILL, J. S. Died at Moscow, Tennessee, 1878.

HODGES, W. R., Memphis, Tennessee. Died at Memphis September 4, 1878.

HOPHOLDT, —. Died at Vicksburg, Miss., 1878.

HOPSON, H. R. Died at Memphis, Tennessee, Aug. 25, 1878.

HOPSON, J. L. Died at Somerville, Tennessee, 1878.

HUNTER, JOHN. Died at Bell's Depot, Tennessee, 1878.

HUGHES, E. WILLIAM. For sketch, see Report.

INGALLS, —. Died in Main Street, Memphis, Tenn., Sept. 7, 1878.

KEATING, MICHAEL TONNEL, M.D., was born in Ireland; died at Memphis, Tennessee, October 18, 1878. He was the son of a physician who was surgeon to the fourth Royal Irish Dragoon Guards of the English army. The subject of this sketch received a Dublin University education. Coming to this country, the Doctor settled in New Orleans, where he enjoyed the friendship and confidence of the elder Dr. Shane, a leading physician of the city. He was in practice in the Crescent City over thirteen years before the civil war broke out. His martial ardor led him to take an active part in the struggle. After the war Dr. Keating removed to the city of New York, where he practised with success. When the yellow fever became epidemic, and a call for physicians was made, he again went where danger was greatest, and fell with his face to the foe, on the Doctor's battle-field of glory.

Data from "Heroes, Honors, and Horrors of Yellow Fever of 1878."

J. M. T.

KENNON, C. E. Died at Tangipahoa, La., 1878.

KIBBEE, G. W., M.D., the inventor of a fever cot, died at New Orleans, Louisiana, September 25, 1878. He was a grave, dignified, well-informed physician, says a writer in the *New York Sun* of October 26, 1878, who had recently come to that city to practise.

On the epidemic of yellow fever assuming alarming proportions in the South, he resolved to go to New Orleans, as he believed he was in possession of the knowledge of a method of treatment that he had been applying for years, which would cure the disease, and which he desired to bring into general use. The Doctor

was thoroughly persuaded of his power to control the disease. Dr. Kibbee found immediate employment in the Crescent City to test his method of treatment, which at first found advocates, but at length fell himself a victim. Whatever might be said as to his vanity and temerity, his was a generous sacrifice of a brave and I believe a good man. I have had no information save what the public press gives to prepare a sketch of Dr. Kibbee's life.

J. M. T.

KIRBY, —. Died near Greenville, Miss., 1878.

LAWTON, R. H., Memphis, Tennessee. Died at the hospital in Louisville, Kentucky, September 21, 1878.

LEHMAN, ISIDORE. Died at New Orleans, La., Sept. 12, 1878.

LEWIS, JOHN, Denison, Texas. Died at Holly Springs, Mississippi, September 26, 1878.

LILLY, T. W. Died at Delhi, La., 1878.

LINDLEY, NEWTON ADAMS. Died at Grand Junction, Tenn., September, 28, 1878.

LOWRY, WILLIAM R., Memphis, Tennessee. Died at Memphis, October 6, 1878.

LUCK, S. M. Died at Collierville, Tennessee, 1878.

LYON, J. E. Died at Handsboro, Miss., 1878.

MAGRUDER, J. T., M.D., died of yellow fever near Canton, Madison County, Mississippi, 1878. He was a graduate in medicine from the University of Louisiana, and was an enthusiastic lover of the profession and devoted to the relief of human suffering.

About the time the fever was becoming epidemic in Canton some of the Doctor's patrons requested him not to attend fever cases there, as such a course might be the means of bringing it to their neighborhood and to their and to his own danger. The Doctor replied that he felt in honor bound to attend any and all cases of sickness to which he might be summoned, irre-

spective of the character of the disease. Although he was thus admonished and threatened with the loss of important patronage, he persevered. The disease soon enveloped the whole section, and those who counselled him not to attend the fever were glad to have his services. Constant labor, with no possible opportunity for even necessary sleep and regularity in meals, soon broke down the Doctor's vigor, so that he was stricken with the disease, and in a brief time was numbered with the army of martyrs to professional zeal and duty.

Data from Dr. S. M. Bemiss.

J. M. T.

MANNING, THOMAS D., Austin, Texas. Died at Holly Springs, Mississippi, September 20, 1878.

MAY, W. B. Died at Grenada, Miss., September 13, 1878.

MAYSON, —. Died at Terrene, Ark., 1878.

MCCALL, J. S. Died at Greenville, Miss., October 5, 1878.

MCCALLUM, G. C., M.D., was born near Claiborne, Jasper County, Miss., August 1, 1845; died at his residence at Lake Station, Miss., September 7, 1878. He was the son of Judge A. McCallum, of Mississippi. Having received a good academical education, he chose medicine for a profession, and attended lectures at the University of Louisiana, where he received his degree of M.D. in 1867. Shortly after this he began practice at Lake Station, where he had a good business. In January, 1870, he was united in marriage to Miss M. J., daughter of the late S. R. Adams, of Paulding. The epidemic of yellow fever carried off his wife and all his children, except one son.

From advance sheets of the *Transactions* of the Mississippi State Medical Association.

J. M. T.

McGEE, M. J. Died at Canton, Miss., August 23, 1878.

McGREGOR, THOMAS H., M.D., of Tipton County, Tennessee, died at Memphis, Tennessee, September 15, 1878. His medical education was had at the University of Louisiana. He settled to practise at Garland, Tipton County, where he resided one

year, and then removed to Mt. Zion as a place of permanent residence, and soon after became a member of the Atoka Medical Society, and was an earnest worker. When the yellow fever made its appearance at Memphis, he volunteered his services to that afflicted city. Dr. McGregor entered upon his work with enthusiasm, and nobly performed the duties imposed upon him, but in a brief period was himself attacked, and fell a victim to his temerity and his conception of professional duty.

Although young, he had lived long enough to attach to himself warm friends, and to win a name among the medical martyrs, whose names go down to posterity as the noblest heroes of the age. The Atoka Medical Society of Tipton County, in special meeting October 28, 1878, passed resolutions of respect for the memory of Dr. McGregor and sympathy with his family, which were directed to be published in the *Nashville Journal of Medicine and Surgery*, from which these meagre facts have been drawn.

J. M. T.

McKAY, R. H. Died at Germantown, Tenn., 1878.

McKIE, NATHAN W., M.D., was born at Canton, Madison County, Miss., July 4, 1849; died at same place August 19, 1878. He was the son of Dr. M. J. McKie, long a successful practitioner in Canton. He received a good education, having great natural capacity for acquiring information. Before he was twenty years of age he was intrusted with the management of the post-office at Vicksburg. He grew up with a preference for the study of medicine, which he began at an early age and pursued under the direction of his father. He attended his first course of lectures at the University of Louisiana at New Orleans, and subsequently at Washington University of Medicine in Baltimore, receiving his degree of M.D. from the latter in 1870, winning the first honors in a class of nearly fifty. On his return he commenced practice at Sharon with his father, and soon gained the confidence of the community. In 1871 he was united in marriage to Miss Mollie McCoal, and in 1877 removed to Canton, and finally succeeded to the practice of the lamented Dr. Cage during his temporary absence at the breaking out of the epidemic at Canton. Excessive labor soon prostrated Dr. McKie, making him a fit subject of the disease from which he

was endeavoring so gallantly to save others. He was stricken down at his post with his armor on. His wife and three children survive him.

From advance sheets of the *Transactions* of Mississippi State Medical Association.

J. M. T.

McKIM, J. W., St. Louis, Mo. Died at Memphis, Tenn., September 9, 1878.

McKINNEY, W. O. Died at Holly Springs, Miss., Oct. 1, 1878.

MEADE, W. C., recently from Hopefield, Arkansas. Died at Memphis, September 28, 1878.

MEARES, T. W. Died at Memphis, September 29, 1878.

MENEES, THOMAS WILLIAMS, M.D., was born in Robertson County, Tennessee; died at Memphis, Tenn., September 15, 1878. He was the eldest son of Prof. Thomas Menees, M.D., of Nashville.

His education was mainly obtained at Emory and Henry College in Virginia. In 1876 he graduated M.D. from the Vanderbilt University with the highest honors of his class. Anatomy was his favorite study, in which he acquired such proficiency that on graduating he was at once elected by the faculty as Assistant Demonstrator of Anatomy in the universities; subsequently he was elected Demonstrator, a position he filled with great ability. The Doctor at once began to practise, and was meeting with good success. His proficiency in anatomy and familiarity with physiology were rapidly bringing him to the front among the leading physicians. As an anatomist and surgeon he gave much promise, and was very popular with his class. The distress of a sister city, Memphis, appealed so to his chivalric nature that he volunteered his services, and fell a victim after one week's service. At a meeting of the physicians of Nashville and Edgefield, on the 17th of September, eulogistic remarks relative to his talents, character, and services were made by numerous members, and resolutions expressive of their appreciation of him, and the loss sustained by the profession and the community, were passed, which were published in the public

papers, and in the *Nashville Journal of Medicine and Surgery*, from which latter these facts are taken. The medical faculty of the medical department of the University of Nashville and Vanderbilt University also passed appropriate resolutions reviewing his career and promise of usefulness had life been spared.

J. M. T.

MILAN, E. E. Died at Paris, Tennessee, 1878.

MILTON, JOHN L. Died at Grenada, Mississippi, Aug. 19, 1878.

MONETTE, W. E., M.D., was born in Monroe County, Mississippi, June 7, 1834; died in his native county —, 1878. He was educated at Oakland College, Mississippi. Having pursued the study of medicine and attended lectures at the University of Louisiana, and also at the University of Pennsylvania, he received from the latter the degree of M.D. in 1857.

He began practice in Louisiana, where he met with good success, but on the breaking out of the war served as surgeon and as brigade surgeon in the Confederate army. After the war he resided and practised in his native county, where he was actively engaged in professional labor until his death.

From advance sheets of the Transactions of the Mississippi State Medical Association.

J. M. T.

MONTGOMERY, BENJAMIN RUSH, JR., M.D., was born in Chattanooga, Hamilton County, Tennessee, March 26, 1848; died at the Peabody Hotel, Memphis, Tennessee, October 9, 1878. He was the son of Benjamin R. Montgomery, Esq., a lawyer of distinction, who died in Chattanooga in 1853. He was at one time a candidate for Governor of Tennessee, and a personal friend and companion of President J. K. Polk. His mother was Matilda Warren Belle. His paternal ancestors were from Ireland, a number of whom were patriots in the American Revolution. General Richard, who fell at Quebec in the storming of that ancient fortress, was in the immediate line of paternal ancestry. His uncle, Major Lemuel Purnell Montgomery, who was killed in the battle of the Horse Shoe, March 27, 1814, under the command of General Jackson, was the eldest brother of the Doctor's

father. His great-grandmother was Mary Moore, a relation of Ireland's sweetest poet, Thomas Moore.

The subject of this sketch received his academic education at Hiwassee College, Monroe County, Tennessee, where he graduated in 1867. His medical studies were pursued in Cleveland, Tennessee, under the supervision of Dr. G. A. Long. He then attended lectures at the University of Tennessee, in Nashville, Tennessee, where he graduated in 1877. In July of this year he opened an office and began practice in Cleveland, Tennessee, and was gradually acquiring the confidence of the community and professional business.

When the fever-stricken cities of the South, and particularly those of his own State, were sorely oppressed by the deaths of the trusted local physicians, and a panic of wild despair took possession of the people, and they called upon other parts of the country for physicians to fill the places of those who died at their posts, Dr. Montgomery's humanity was profoundly moved, so that he volunteered his services for their relief with a full knowledge of all the danger attendant upon the step he resolved to take. The following is a copy of a letter he wrote his brother on the eve of his departure for Memphis:

CHATTANOOGA, September 10.

J. W. MONTGOMERY.

DEAR BROTHER: Doctor Norris died last night at 9½ o'clock. I think that I will start to-night for Memphis. It looks like going into the jaws of death.

Your affectionate brother,

B. R. M.

On arriving at Memphis he was assigned to duty by Dr. Mitchell, the physician-in-chief of the Howard Association. The distress and sickness which were so universal around him left him little or no time for rest. According to the testimony of his *confrères* and the nurses, he labored continuously and efficiently until stricken down in death. His name will live with his fellow-martyrs, in this noted epidemic.

Dr. Montgomery was never married. He enjoyed throughout life excellent health, was a man of good physique, five feet eleven inches in height, weighing generally about one hundred and eighty-seven pounds, had black hair and beard, and large deep blue eyes, and always a man of correct deportment. His manner and voice were sympathetic, winning the confidence of his patient, and giving encouragement which was equal to medicine.

He was an Odd Fellow, and also a member of the order of the Knights of Pythias. He inherited a fine estate, and except for winning the honors of his profession, he could have had no motive in going to Memphis. It exhibited, however, the chivalry of his ancestors, just what might have been expected. He was a man of courage and heroic impulses, and met his death in the ranks of the bravest of the brave. He has nobly won a martyr's crown. His remains were interred in Elmwood Cemetery at Memphis.

Data from J. W. Montgomery, Esq.

J. M. T.

MONTGOMERY, WM. Died at Greenville, Miss., Oct. 5, 1878.

MONLEY, THOMAS. Died at New Orleans, September 28, 1878. This gentleman was not generally recognized as a physician.

MOORE, WM. Died at Port Gibson, Miss., 1878.

NESMITH, W. J. Died in Warren County, Mississippi, 1878.

NEWMAN, JAMES C. Died at Vicksburg, Mississippi, October 6, 1878. He was a member of the Mississippi State Medical Society.

NORRIS, JAMES BARBY, M.D., was born in Delaware County, Ohio, May 18, 1849; died at Vicksburg, Miss., September 10, 1878. He was the son of the Hon. William G. and Phœbe (Main) Norris, farmers near Delaware, Ohio. His education was had at the schools and academies of his native county, but he received his degree of A.B. at Kenyon College in 1866, and A.M. in 1871. He pursued his medical studies under the instruction of Dr. J. H. Van Deman in Chattanooga, Tenn.

He attended his first course of lectures at the Miami Medical College at Cincinnati, Ohio, and his second at Detroit, Michigan, where he graduated M.D. in 1872. Returning to Chattanooga, he commenced to practise in that city August 1, 1872, and had acquired a good business and high standing in the county.

When Dr. Norris learned of the distressed condition of Vicksburg, and the want of physicians, he chivalrously volunteered his services, and went there on the 31st of August with sixteen nurses, and was at once assigned to duty, and on the 10th of

September was a corpse. Seven of the nurses who accompanied him also died of the fever. His remains rest in the National Cemetery at Chattanooga, as per special order of the Secretary of War.

Dr. Norris was a member of the school-board of Chattanooga, city physician, member of the Tennessee State Medical Society, the Hamilton County Medical Society, and honorary member of the Delaware County Medical Society of Ohio; a member of the Phi Beta Kappa Society of his alma mater; a member of the Grand Lodge of Masons of Tennessee, and many others—all of which, with the city councils, passed resolutions of condolence with his parents and of respect to his memory.

Dr. J. H. Van Deman has in press a carefully prepared memoir of Dr. Norris. Although this is a conspicuous case of great heroism from a sense of duty on the part of a physician, and inviting to the writer to portray nobility of character exhibited by medical men in the late epidemic, I will close this notice, and with the profession await the promised publication by the Doctor's partner and literary executor, who has furnished the few facts given.

J. M. T.

NUGENT, P. C., St. Louis, Mo. Died at Memphis, Tenn., Sept. 14, 1878.

ODEN, —. Died at Stoneville, Miss., 1878.

OTey, PAUL H., son of Bishop Otey, of Tenn. Died at Memphis, Tenn., Sept. 29, 1878.

PATILLO, R. H. Died in Walnut Street, Memphis, Sept. 11, 1878.

PEARCE, HIRAM M., Cincinnati. Died at Memphis, Tenn., Sept. 16, 1878.

PEEBLES, BERLIN, M.D., a native of Tennessee, died in Memphis, October 3, 1878. He graduated in medicine at the University of Nashville in 1878, and at once took up his residence at Memphis.

When the yellow fever reached there he was solicitous for business. Under the systematic division of labor devised by the Howard Association, he was assigned to duty in one of the hos-

pitals. In this position he labored zealously and faithfully to the honor of his chosen profession, and to the relief of many of his fellow-citizens.

Dr. Peebles was associated with other physicians in making post-mortem examinations, and studying the pathological changes observed. These notes will, says the *Nashville Journal of Medicine and Surgery*, be published at an early day.

J. M. T.

PEETE, J. S. Died at Mason, Tenn., 1878.

PENN, J. E. Died at Court Street Infirmary, Memphis, Tenn., Sept. 16, 1878.

PENNISSE, J. G., Indianapolis, Ind. Died at Memphis, Tenn., 1878.

PERKINS, P. A. Died at Collierville, Tenn., Sept. 17, 1878.

POTTS, —, of Louisiana. Died at Vicksburg, Miss., Sept. 13, 1878.

POWELL, J. W., of Hernando, Miss. Died Oct., 1878.

PRATHER, HUGH L., M.D., was born in Fulton County, Ky., August 9, 1854; died, of yellow fever, at Hickman, Ky., September 12, 1878. He was the son of Richard C. and Martha J. Prather. Having received a good education, he studied medicine, attending lectures at the University of Louisville, Ky., where he received his degree of M.D. in 1877. He practised in Mississippi County, Mo., and was gradually acquiring business and reputation.

In July, 1877, he was united in marriage to Miss Mollie Morrow.

On the yellow fever becoming epidemic at Hickman, he considered it to be his duty to go and help his brother, and that severely afflicted community. He was attacked with the fever ten days after his brother, but preceded him to the grave. The remains of the two are laid side by side, victims of that terrible conflict which raged for a brief season at Hickman.

Data from memorial sketches by Dr. J. W. Singleton, read before the Southwestern Kentucky Medical Association.

J. M. T.

PRATHER, RICHARD CATLETT, M.D., was born in Fulton County, Ky., May 11, 1852; died, of yellow fever, at Hickman, Ky., September 28, 1878. He was the son of Richard C. and Martha J. Prather. He grew to manhood and was educated in his native county.

His medical studies were pursued with the late Dr. H. C. Catlett, of Hickman. Dr. Prather attended his first course of lectures at the Medical Department of the University of Louisville, and his second at the Jefferson Medical College, Philadelphia, where he graduated M.D. in 1875.

Immediately after returning home, he located at Hickman to practise, and by assiduity had acquired a good business, considering his years, and had won the esteem of the whole community. He was united in marriage to Miss Lizzie Stephens, of Fulton County, on the 26th of July, 1876, who, with an infant daughter born since his death, survives him.

Dr. Prather was a member of the Southwestern Kentucky Medical Association. A knight of honor and a martyr to professional duty.

Data from memorial sketches, by Dr. J. W. Singleton, read before the Southwestern Kentucky Medical Association.

J. M. T.

PREWITT, J. H. Died at Grand Junction, Tenn., 1878.

PREWITT, NATHAN HILL, M.D., was born in Newberry District, South Carolina, August 6, 1829; died at Grand Junction, Tennessee, October 8, 1878. He was the son of James and Elizabeth (Hill) Prewitt, of Grand Junction. His academical education was obtained at the public schools and at Phillips Academy near Summerville. In 1848 he commenced the study of medicine under Dr. J. O. Stevenson, attended lectures at the University of Louisville, Ky., and also at the University of New York, and graduated M.D. in 1851. He settled to practise the same year in Marshall County, Miss.

In 1853 he removed to Fayetteville, Tenn., where he remained in active practice until his death. He was mail agent or postmaster at Grand Junction for some years, and held that position at the time of his death. He was something of a politician, and a writer for the public political press, and at one time associate editor of a paper at Grand Junction.

Until his death, and for some years prior, he was medical examiner of pensions; he was a member of the Masonic fraternity, and of the Knights of Honor. The Doctor always enjoyed good health, and had a fine personal appearance. The Tennessee State Medical Society placed his name in the roll of honor, among those who fell in the epidemic of yellow fever in 1878. In 1852 Dr. Prewitt was married to Mary Susan, daughter of Richard and Martha Perkins, by whom he had seven children.

Data supplied by Dr. F. E. Prewitt, brother of deceased.

J. M. T.

RAINS, —. Died at White Haven, La., 1878.

REIMER, J. S., Indianapolis, Ind. Died at Memphis, Tenn., Sept. 16, 1878.

REINHARDT, —. Died at Jefferson Street, Memphis, Tenn., Oct. 13, 1878.

RINGGOLD, RICHARD SMITH, M.D., was born in Maryland, Jan. 26, 1829; died at Grenada, Mississippi, Monday, September 8, 1878. He was the son of Samuel and Mary H. (Smith) Ringgold.

Having acquired his professional education he practised for a time at Hickman, Kentucky, and also at Mayfield, Kentucky. During the war between the States he was a surgeon in the Confederate army. After the war he settled at Grenada, and was there in 1870. He was a married man, and leaves some children.

He was a member of the Grenada County Medical Society, and also of the Mississippi State Medical Association. His remains are interred in the Odd Fellows' Cemetery, Grenada.

Facts furnished by Dr. L. Saunders, of Grenada.

J. M. T.

ROACH, J. S. Died at Vicksburg, Mississippi, Sept. 26, 1878.

ROBBINS, W. H. Died at Bartlett, Tennessee, 1878?

ROBERTS, C. S., Sulphur Springs, Ky. Died at Memphis, Tennessee, Sept. 29, 1878.

ROCHE, M. A. Died at Pattersonville, La., October 17, 1878.

ROGERS, J. C. Died at Memphis, Tenn., August 25, 1878.

SAMPLE, G. F., Austin, Tenn. Died at Memphis, Tennessee, October 7, 1878.

SANBOURN, C. Died at Thebadeaux, La., 1878.

SAPPINGTON, —. Died at Vicksburg, Miss., Sept. 13, 1878?

SEN, W. Died at Memphis, Tennessee, 1878?

SARNER, F. Died at Memphis, Tennessee, Aug. 15, 1878?

SHERMAN, —. Died at Brownsville, Tennessee, 1878.

SMITH, WILLIAM DANGERFIELD. Born at Point Coupee Parish, La. Died at Smithland Plantation, La., September 25, 1878.

SPRATT, W. D. Died at Port Gibson, Miss., Oct. 1, 1878.

ST. CLAIR, T. C., of Vaiden, Miss. Died at Memphis, 1878.

STAFFORD, —. Died at Greenville, Mississippi, Oct. 1, 1878?

STROBRIDGE, J. G. Died at Port Gibson, Miss., Oct. 1, 1878.

SWASEY, H. A. Died at Tangipahoa, La., Sept. 18, 1878.

TARRY, THOMAS H. Died at Galloway, Tennessee, 1878.

TATE, R. H. (colored), of Cincinnati, Ohio. Died at Memphis, September 29, 1878.

TAYLOR, —. Died at Camp Joe Williams, Memphis, Tenn., 1878.

TAYLOR, J. THEUS, of New York. Died at New Orleans, La., September 25, 1875. Was a native of South Carolina, and volunteered his services to the Howard Association of New Orleans; was about sixty years of age, and son of Dr. Theus Taylor of S. C., who was a prominent physician of his State. He was educated at the schools of Charleston, and graduated afterward with honor at the University of Pennsylvania. After commencement of the late war was appointed surgeon-general by the Confederate

government of the army of the Mississippi. He was the inventor or originator of the hospital tents used in the Confederate army in Mississippi Valley. After the war he settled at New Orleans, then removed to New York city. Was a member of the New York County Medical Society.

J. M. T.

TUERKE, P., Cincinnati, Ohio, a German by birth. Died at Memphis, Tennessee, September 29, 1878.

TREMBLE, —. Died at Friar's Point, Mississippi, 1878.

TURNIPSEED, —. Died at Valley Home, Miss., 1878.

WALDO, RUSSELL, M.D., was born in Portage County, Ohio, July 3, 1846; died at his post in Cairo, Illinois, Oct. 16, 1878. He received a good academic education, graduating at the high school at Ravenna, Ohio, at the age of seventeen.

His medical studies were commenced in 1869 at the National Medical College, Washington, D. C., attending for several courses of lectures, graduating M.D. in 1875. He was during this time a clerk in public office. After obtaining his degree he began practice, attending to whatever business he could get before and after office hours. His practice was encouraging, but he conceived a desire to enter the Marine Hospital Service, and, standing a satisfactory examination, was commissioned assistant-surgeon February 8, 1877, and was assigned to duty at Cairo, Illinois, where he labored faithfully and acceptably to the department until his death.

The Doctor was well known in Washington, where he had held clerical position in the Second Auditor's Office, and also in the Freedmen's Bureau. He left a wife and two children, one of whom was born after his death.

J. M. T.

WARE, JOHN J., M.D., was born in Brownsville, Haywood County, Tennessee, August 23, 1839; died of what is publicly reported as yellow fever in same place October 8, 1878.

He was the son of John D. and Julia M. (Taliaferro) Ware. The Doctor received his academical education at Chapel Hill Academy, Virginia. Having selected medicine as a profession, he became a student of Dr. Garland Taliaferro, and when suffi-

ciently advanced attended lectures at the University of Pennsylvania, where he graduated M.D. in 1861. His thesis was on "Remittent Fever."

Dr. Ware settled to practise in Memphis, Tennessee, in 1861, and soon acquired a fair business. In 1865, however, he was induced to remove to Brownsville, the county seat of Haywood County, to practise. Here he remained in active and full general practice until stricken down by the prevailing epidemic.

He was a member of the Haywood County Medical Society, and the Tennessee State Medical Society. Although a close observer, and well posted in the best medical literature, and acquainted with the most recent methods of diagnosis and treatment, he was averse to writing or appearing before the public.

I do not find that he has contributed any article to medical literature. He was much respected and a man of influence in the county. He was not married. His remains rest in Oakland Cemetery.

J. M. T.

WATSON, K. P., M.D., of Memphis, Tenn., died in that city, Aug. 30, 1878. The *Memphis Appeal* says he was an efficient worker, both as a physician and nurse, in the epidemic of 1873. When the disease returned to distress that city, he again entered the field as a worker, with experience and confidence in his efforts to stay the ravages of the disease and of doing much good. His death was saddened by the fact that he died alone at 56½ Second Street, on a mattress spread upon the floor of a room almost without furniture. He lived in a different part of the city; how or when he came there, and to die alone, is not known. The presumption is, that in a state of delirium in the fever he had wandered off and taken up quarters in this lonely place, where he may have languished for hours or even days without the services of a physician or nurse to relieve his suffering or smooth his dying pillow.

J. M. T.

WHEELER, J. M. Died at Moscow, Tenn., 1878.

WHITE, J. M., of Austin, Miss. Died at Memphis, 1878.

WHITE, J. S., Macon, Ga. Died at Memphis, Sept. 30, 1878.

WHITEHEAD, PETER FLANAGAN. For sketch, see Report.

WILLIAMS, R. B., Woodburn, Ky. Died at Memphis, Tenn., Sept. 8, 1878.

WILLS, W. S. Died at Brownsville, Tenn., 1878.

WILLIAMSON, WILLIAM BOSWELL, M.D., was born at Sussex Court House, Va., Nov. 23, 1817; died at his residence, Edwards Depot, Hines County, Miss., Sept. 22, 1878. He received a good education, and selecting medicine as a profession, attended lectures at the University of Pennsylvania, where he graduated M.D. in 1835. His thesis was on the subject of "Acute Peritonitis."

In the war between Texas and Mexico he served as a surgeon, and after this settled in Hines County, Miss., where he remained as a practitioner for several years. He removed for a short time to the city of New Orleans, but returned to Hines County, and settled at Edwards. Dr. Williamson was secretary to the first medical society formed in Mississippi, and retained his membership to the time of his death. He was also a member of the Medico-Physical Society of New Orleans, and of the Hines County Medical Society; also of the Mississippi State Medical Society. He was superintendent of the State Lunatic Asylum, August, 1852, to 1857, and served as surgeon in the Confederate army during the war. In 1843 he was married to Isabella Wydown, of Charlottesville, Va.

Data from newspapers and from "Physicians and Surgeons of the United States." Also advance sheets of the Transactions of the Mississippi State Medical Association.

J. M. T.

WILSON, NORVELL W. Died at New Orleans, La., 1878.

WOODRUFF, Z. TAYLOR, M.D., was born in Tuscaloosa, Ala., June 17, 1849; died at Turk, Ala., July 12, 1878. When a youth he went to Vicksburg. He was fond of study, and having acquired a fair education, studied medicine and enjoyed hospital advantages. His medical degree was obtained after the usual attendance on lectures at the University of Louisiana in 1878.

He began practice in St. Louis, Mo., remaining there about one year, and then went to Hall County, Ala., but finally settled in Vicksburg, where he was soon after made health-officer. He

performed this duty until within a brief period of his death, when his health gave way from overwork. At the urgent advice of friends he left for a visit to relations in Alabama, with a hope of recovering, but he died just fifteen days after leaving Vicksburg.

From advance sheets of the Transactions of the Mississippi State Medical Association.

J. M. T.

WOODWARD, JOHN D., Memphis. Died at Memphis, Tenn., 1878.

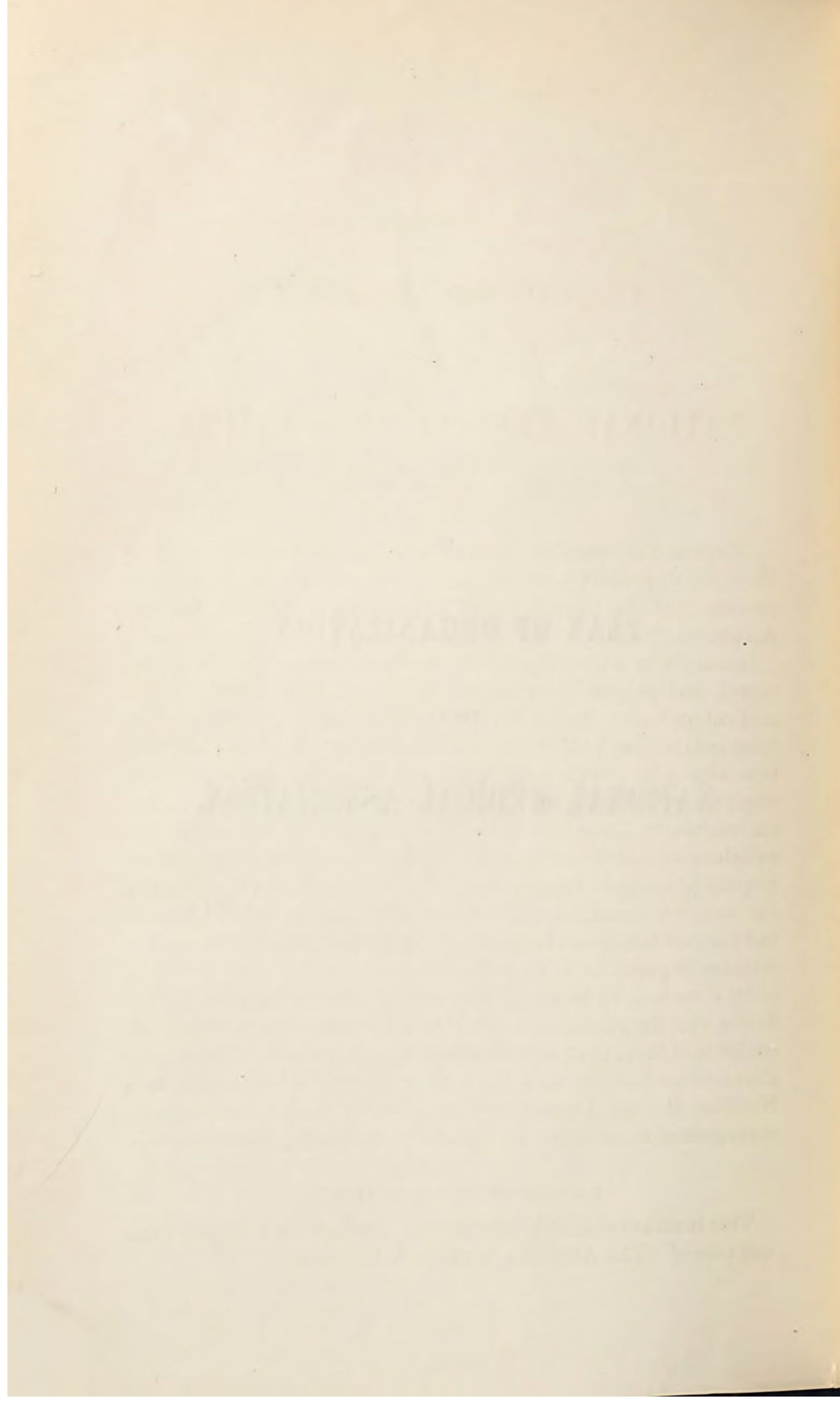
WOODFERN, GEORGE W., Paducah, Ky. Died at Grenada, Miss., Sept. 13, 1878.

WUVMAN, —. Died at Bovina, Miss., 1878.

YOUNG, THOMAS. Died at Port Gibson, Miss., Oct. 7, 1878.

ZENZER, WILHELM. Died at New Orleans, La., Sept. 12, 1878. It is hardly claimed that he was a scientific physician.

PLAN OF ORGANIZATION
FOR A
NATIONAL MEDICAL ASSOCIATION.



PLAN OF ORGANIZATION

FOR A

NATIONAL MEDICAL ASSOCIATION.

Whereas, The Medical Convention, held in the city of New York, in May, 1846, have declared it expedient "for the medical profession of the United States to institute a National Medical Association;" and,

Inasmuch as an institution so conducted as to give frequent, united, and emphatic expression to the views and aims of the medical profession in this country, must, at all times, have a beneficial influence, and supply more efficient means than have hitherto been available here for cultivating and advancing medical knowledge; for elevating the standard of medical education; for promoting the usefulness, honor, and interests of the medical profession; for enlightening and directing public opinion in regard to the duties, responsibilities, and requirements of medical men; for exciting and encouraging emulation and concert of action in the profession, and for facilitating and fostering friendly intercourse between those who are engaged in it: therefore,

Be it resolved, In behalf of the medical profession of the United States, that the members of the Medical Convention, held in Philadelphia in May, 1847, and all others who, in pursuit of the objects above mentioned, are to unite with or succeed them, constitute a National Medical Association; and that, for the organization and management of the same, they adopt the following *Regulations*:—

I.—TITLE OF THE ASSOCIATION.

This institution shall be known and distinguished by the name and title of "The American Medical Association."

II.—MEMBERS.

The members of this institution shall collectively represent and have cognizance of the common interests of the medical profession in every part of the United States; and shall hold their appointment to membership either as delegates from local institutions, as members by invitation, or as permanent members.

The *Delegates* shall receive their appointment from permanently organized State medical societies, and such county and district medical societies as are recognized by representation in their respective State societies, and from the medical department of the army and navy of the United States.

Each delegate shall hold his appointment for one year, and until another is appointed to succeed him, and shall participate in all the business and affairs of the Association.

Each State, county, and district medical society, entitled to representation, shall have the privilege of sending to the Association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half that number; *Provided*, however, that the number of delegates from any particular State, Territory, county, city, or town shall not exceed the ratio of one in ten of the resident physicians who may have signed the Code of Ethics of this Association. The Medical Staffs of the army and navy shall be entitled to four delegates each.

No individual who shall be under sentence of expulsion or suspension from any State or local medical society of which he may have been a member, or whose name shall have been, for non-payment of dues, dropped from the rolls of the same, shall be received as a delegate to this Association, or be allowed any of the privileges of a member, until he shall have been relieved from the said sentence or disability by such State or local society, or shall have paid up all arrears of membership; nor shall any person not a member and supporter of a local medical society, where such a one exists, be eligible to membership in the American Medical Association.

No one expelled from this Association shall at any time thereafter be received as a delegate or member, unless by a three-fourths vote of the members present at the meeting to which he is sent, or at which he is proposed.

Members by Invitation shall consist of practitioners of reputable standing from sections of the United States not otherwise repre-

sented at the meeting. They shall receive their appointment by invitation of the meeting, after an introduction from, and being vouched for by, at least three of the members present, or three of the absent permanent members. They shall hold their connection with the Association until the close of the annual session at which they are received; and shall be entitled to participate in all its affairs, as in the case of delegates, except the right to vote.

The *Permanent Members* shall consist of all those who have served in the capacity of delegates, and of such other members as may receive the appointment by unanimous vote, and shall continue such so long as they remain in good standing in the body from which they were sent as delegates, and comply with the requirements of the By-laws of the Association. Permanent members shall at all times be entitled to attend the meetings, and participate in the affairs of the Association, so long as they shall continue to conform to its regulations, but without the right of voting; and, when not in attendance, they shall be authorized to grant letters of introduction to reputable practitioners of medicine residing in their vicinity, who may wish to participate in the business of the meeting, as provided for members by invitation.

Every member elect, prior to the permanent organization of the annual meeting, or before voting on any question after the meeting has been organized, must exhibit his credentials to the proper committee, and sign these regulations, inscribing his name and address in full, specifying in what capacity he attends, and, if a delegate, the title of the institution from which he has received his appointment.

III.—MEETINGS.

The regular meetings of the Association shall be held annually and commence on the first Tuesday in May or first Tuesday in June. The place of meeting shall be determined, with the time of meeting for each next successive year, by vote of the Association.

IV.—OFFICERS.

The officers of the Association shall be a President, four Vice-Presidents, one Permanent and one Assistant Secretary, a Treasurer, and Librarian. They shall be nominated by a special committee of one member from each State represented at the meeting, and shall be elected by vote on a general ticket.

Each officer, except the Permanent Secretary, shall hold his

appointment for one year, and until another is elected to succeed him. The Permanent Secretary shall hold his appointment until removed by death, resignation, or a vote of two-thirds of the members present at a regular annual meeting.

The President and Vice-Presidents shall assume the functions of their respective offices at the beginning of the annual meeting next succeeding their election; all other officers shall enter upon their duties immediately after their election.

The President shall preside at the meetings, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require.

The Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and during the absence, or at the request of the President, one of them shall officiate in his place.

The Permanent Secretary shall record the minutes and authenticate the proceedings; give due notice of the time and place of each next ensuing annual meeting; notify all members of committees of their appointment, and of the duties assigned to them; hold correspondence with other permanently organized medical societies, both domestic and foreign; serve as a member of the Committee of Publication; see that the published *Transactions* are promptly distributed to all the members who have paid the annual assessment, and carefully preserve the archives and unpublished transactions of the Association.

The Assistant Secretary shall aid the Permanent Secretary in recording and authenticating the proceedings of the Association; serve as a member of the Committee of Arrangements, and perform all the duties of Permanent Secretary temporarily, whenever that office shall be vacant, either by death, resignation, or removal.

The Treasurer shall have the immediate charge and management of the funds and property of the Association. He shall be a member of the Committee of Publication, to which committee he shall give bonds for the safe keeping and proper use and disposal of his trust. And through the same committee he shall present his accounts, duly authenticated, at every regular meeting.

The Librarian shall receive and preserve all the property in books, pamphlets, journals, and manuscripts presented to or acquired by the Association, record their titles in a book prepared for the purpose, acknowledge the receipt of the same, and he shall be a member of the Committee of Publication.

V.—STANDING COMMITTEES.

The following standing committees, each composed of seven members, shall be organized at every annual meeting, for preparing, arranging, and expediting business for each next ensuing year, and for carrying into effect the orders of the Association not otherwise assigned, namely, a Committee of Arrangements and a Committee of Publication.

The Committee of Arrangements shall, if no sufficient reasons prevent, be mainly composed of seven members, of whom the Assistant Secretary shall be one, residing in the place at which the Association is to hold its next annual meeting; and shall be required to provide suitable accommodations for the meeting, to verify and report upon the credentials of membership, to receive and announce all essays and memoirs voluntarily communicated, either by members of the Association, or by others through them, and to determine the order in which such papers are to be read and considered.

The Committee of Publication, of which the Secretaries, Treasurer, and Librarian must constitute a part, shall have charge of preparing for the press, and of publishing and distributing such of the proceedings, transactions, and memoirs of the Association as may be ordered to be published. The six members of this Committee, who have not the immediate management of the funds, shall also, in their own names as agents for the Association, hold the bond of the Treasurer for the faithful execution of his office, and shall annually audit and authenticate his accounts, and present a statement of the same in the annual report of the Committee; which report shall specify the character and cost of the publications of the Association during the year, the number of copies still at the disposal of the meeting, the funds on hand for further operations, and the probable amount of the assessment to be laid on each member of the Association for covering its annual expenditures.

VI.—FUNDS AND APPROPRIATIONS.

Funds shall be raised by the Association for meeting its current expenses and awards from year to year, but never with the view of creating a permanent income from investments. Funds may be obtained by an equal assessment of not more than five dollars annually, on each of the delegates and permanent members; by voluntary contributions for specific objects; and by the sale and disposal of publications, or of works prepared for publication.

The funds may be appropriated for defraying the expenses of the annual meetings, including the necessary expenses of the Permanent Secretary in maintaining the necessary correspondence of the Association; for publishing the proceedings, memoirs, and transactions of the Association; for enabling the Standing Committees to fulfil their respective duties, conduct their correspondence, and procure the materials necessary for the completion of their stated annual reports; for the encouragement of scientific investigation by prizes and awards of merit; and for defraying the expenses incidental to specific investigations under the instruction of the Association, where such investigations have been accompanied with an order on the Treasurer to supply the funds necessary for carrying them into effect.

VII.—PROVISION FOR AMENDMENT.

No amendment or alteration shall be made in any of these articles, except at the annual meeting next subsequent to that at which such amendment or alteration may have been proposed; and then only by the voice of three-fourths of all the delegates in attendance.

Provided, however, that when an amendment is properly under consideration, and an amendment is offered thereto, germane to the subject, it shall be in order, and if adopted, shall have the same standing and force as if proposed at the preceding meeting of the Association.

And, in acknowledgment of having adopted the foregoing propositions, and of our willingness to abide by them, and use our endeavors to carry into effect the objects of this Association as above set forth, we have hereunto affixed our names.

NAMES OF MEMBERS.	RESIDENCE.	INSTITUTION REPRESENTED.

B Y - L A W S.

I.—ORDER OF BUSINESS.

The order of business at the annual meetings of the American Medical Association shall at all times be subject to the vote of three-fourths of all the members in attendance; and, until permanently altered, except when for a time suspended, it shall be as follows, viz.:—

1st. The calling of the meeting to order by the President elected the preceding year, or, in his absence, by one of the Vice-Presidents.

2d. The report of the Committee of Arrangements on the credentials of members, after the latter have registered their names and addresses, and the titles of the institutions which they represent.

3d. The reception of members by invitation.

4th. The election of permanent members.

5th. The reading of notes from absentees.

6th. The hearing of the annual address of the President.

7th. The reception of the reports of all special committees and voluntary communications, and their reference to the appropriate Sections.

8th. The appointment of the committee of one from each State represented, to nominate officers of the Association, and to fill the standing committees.

9th. The reading and consideration of the reports of the Standing Committees, of Publication, on Prize Essays, and of Chairmen of Sections.

10th. Resolutions introducing new business, and instructions to the permanent committees.

11th. The selection of the next place of meeting.

12th. The report of the Nominating Committee, and the election of officers of the Association.

13th. Reports from the several Sections.

14th. Reading of the minutes by the Secretary.

15th. Unfinished and miscellaneous business.

16th. Adjournment.

II.—SECTIONS.

The general meetings of the Association shall be restricted to the morning sessions; and the afternoon sessions, commencing at three o'clock, shall be devoted to the hearing of reports and papers and their consideration, in the following *Sections*:—

1. Practical Medicine, Materia Medica, and Physiology.
2. Obstetrics and Diseases of Women and Children.
3. Surgery and Anatomy.
4. Medical Jurisprudence, Chemistry, Psychology, State Medicine and Public Hygiene.
5. Ophthalmology, Otology, and Laryngology.

The chairman and secretary of the several Sections shall, like other officers of the Association, be nominated by the special committee of one member from each State represented at the meeting, and elected by a vote on a general ticket. They shall hold their office until the close of the proper business of the annual meeting next succeeding their election, and until their successors are appointed.

The Section on State Medicine and Public Hygiene shall be composed of one member from each State, one from the army and one from the navy of the United States, representing, as far as practicable, the State Boards of Health. The officers of this Section to be also designated by the Committee on Nominations.

The chairmen of the several Sections shall prepare and read in the general sessions of the Association, papers on the advances and discoveries of the past year in the branches of science included in their respective Sections; the reading of such papers not to occupy longer than forty minutes for each.

It shall be the duty of every member of the Association who proposes to present a paper or report to any one of the Sections, to forward either the paper, or a *title* indicative of its contents, and its *length*, to the Chairman of the Committee of Arrangements at least one month before the annual meeting at which the paper or report is to be read. It shall also be the duty of the Chairman and Secretary of each Section to communicate the same information to the Chairman of the Committee of Arrangements concerning such papers and reports as may come into their possession or knowledge, for their respective Sections, the same length of time before the annual meeting. And the Committee of Arrangements shall determine the order of reading or presentation of all such papers, and

announce the same in the form of a programme for the use of all members attending the annual meeting. Such programme shall also contain the rules specified in the By-laws and Ordinances concerning the consideration and disposal of all papers in the Sections.

No paper shall be read before either of the Sections, the reading of which occupies more than twenty minutes. Such papers shall be referred by the Section to sub-committees especially appointed for their examination. The sub-committees shall be allowed thirty days for such examination; at the end of which time they shall forward the papers to the Committee of Publication, with such recommendation as they may deem proper. The author of such papers, however, may read abstracts before the Section within the allotted twenty minutes. No member shall address the Section more than once upon the same subject, nor speak longer than fifteen minutes without unanimous consent.

All papers presented directly to the Association, and other matters, may, at the discretion of the Association, be referred to the various sections for their consideration and report.

III.—STANDING COMMITTEES.

The following are the Standing Committees of the Association, to be filled by the Committee on Nominations, and to report at the next annual meeting subsequent to their appointment, viz.: Committee of Arrangements; Committee of Publication; Committee on Prize Essays; and Committee on American Medical Necrology.

The *Committee of Publication* shall append to each volume of the *Transactions* hereafter published, a copy of the Constitution, By-Laws, and Code of Ethics of the Association. It shall print conspicuously, at the beginning of each volume of the *Transactions*, the following disclaimer, viz.: The American Medical Association, although formally accepting and publishing the reports of the various standing committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.

The *Committee on Prize Essays* shall consist of five members, residing in the same neighborhood, whose duty it shall be, in the interval between the present and the next succeeding annual sessions, to receive original papers upon any medical subject, from any persons who may choose to send them; to decide upon the merits of these papers, and to select for presentation to the Association, at its next session, such as they may deem worthy of being thus presented.

The Committee shall have power to form such regulations as to the mode in which the papers are to be presented, and as to the observing of secrecy, as they may think proper; and also to award two prizes of one hundred dollars each, to the best two original communications reported on favorably by them, and directed by the Association to be published.

The *Committee on American Medical Necrology* shall consist of one member for each State and Territory represented in the Association, whose duty it shall be to procure memorials of the eminent and worthy dead among the distinguished physicians of their respective States and Territories, and transmit them to the chairman of this committee on or before the first of April of each and every year.

IV.—THE PUBLICATION OF PAPERS AND REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

The Committee of Publication shall have full discretionary power to omit from the published *Transactions*, in part or in whole, any paper that may be referred to it by the Association, or either of the Sections, unless specially instructed to the contrary by vote of the Association.

V.—ASSESSMENTS.

The sum of five dollars shall be assessed, annually, upon each delegate to the sessions of the Association, as well as upon each of its permanent members, whether attending or not, for the purpose of raising a fund to defray necessary expenses. The payment of this sum shall be required of the delegates and members in attendance upon the sessions of the Association previously to their taking

their seats and participating in the business of the sessions. Permanent members, not in attendance, shall transmit their dues to the Treasurer.

Any permanent member who shall fail to pay his annual dues for three successive years, unless absent from the country, shall be dropped from the roll of permanent members, after having been notified by the Secretary of the forfeiture of his membership.

VI.—DELEGATES FROM THE MEDICAL STAFFS OF THE ARMY AND NAVY.

Delegates representing the medical staffs of the United States Army and Navy, shall be appointed by the Chiefs of the Army and Navy Medical Bureaus. The number of delegates so appointed shall be four from the army medical officers, and an equal number from the navy medical officers.

VII.—DELEGATES TO FOREIGN MEDICAL SOCIETIES.

The President shall be authorized annually to appoint delegates to represent this Association at the meetings of the British Medical Association, the American Medical Society at Paris, and such other scientific bodies in Europe or other foreign countries as may be affiliated with us.

VIII.—DUTIES OF MEMBERS.

No one shall be permitted to address the Association, except he shall have first given his name and residence, which shall be distinctly announced from the chair, and the member may be required to go forward and speak from the stand, but not more than ten minutes at one time.

No one appointed on a special committee, who fails to report at the meeting next succeeding the one at which he is appointed, shall be continued on such committee, or appointed on any other, unless a satisfactory excuse is offered.

IX.—CONDITION EXCLUDING REPRESENTATION.

No State or Local Medical Society, or other organized institution, shall be entitled to representation in this Association that has not adopted its Code of Ethics; or that has intentionally violated or disregarded any article or clause of the same.

X.—OF THE PREVIOUS QUESTION.

When the previous question is demanded, it shall take at least twenty members to second it; and when the main question is put under force of the previous question and negatived, the question shall remain under consideration the same as if the previous question had not been enforced.

XI.—JUDICIAL COUNCIL.

A council, consisting of twenty-one members, shall be appointed by the Nominating Committee, whose duty it shall be to take cognizance of, and decide, all questions of an ethical or judicial character that may arise in connection with the Association. Of the twenty-one members of the council first appointed the seven first named on the list shall hold office one year, and the second seven named shall hold office two years.

With these exceptions the term of office of members of the council shall be three years, seven being appointed by the Nominating Committee annually.

The said council shall organize by choosing a President and Secretary, and shall keep a permanent record of its proceedings. The decisions of said council on all matters referred to it by the Association shall be final, and shall be reported to the Association at the earliest practical moment.

All questions of a personal character, including complaints and protests, and all questions on credentials, shall be referred at once, after the report of the Committee of Arrangements or other presentation, to the *Judicial Council*, and without discussion.

XII.—NEW BUSINESS.

No new business, resolutions by members, etc., shall be introduced at the general session of the Association except on the first and fourth days of meetings.

ORDINANCES.

Resolved, That the several Sections of this Association be requested, in the future, to refer no papers or reports to the Committee of Publication, except such as can be fairly classed under one of the three following heads, viz: 1st. Such as may contain and establish *positively* new facts, modes of practice, or principles of real value. 2d. Such as may contain the results of well-devised original experimental researches. 3d. Such as present so complete a review of the facts on any particular subject as to enable the writer to deduce therefrom legitimate conclusions of importance.

Resolved, That the several sections be requested, in the future, to refer all such papers as may be presented to them for examination by this Association, that contain matter of more or less value, and yet cannot be fairly ranked under either of the heads mentioned in the foregoing resolution, back to their authors with the recommendation that they be published in such regular medical periodicals as said authors may select, with the privilege of placing at the head of such papers, "Read to the _____ Section of the American Medical Association on the _____ day of _____ 18 ____."

(Vide *Transactions*, vol. xvi. p. 40.)

Resolved, That, instead of yearly reprinting the list of members of the American Medical Association, the Committee of Publication be instructed to prepare and print in the *Transactions* an alphabetical catalogue triennially, containing a complete list of the Permanent Members, with their names in full, designating their residences, the year of their admission, the offices they may have held in the Association, and, in case of death or rejection, the date thereof. (Vide *Transactions*, vol. xvii. p. 33.)

Resolved, That no report or other paper shall be presented to this Association unless it be so prepared that it can be put at once into the hands of the Permanent Secretary, to be transmitted to the Committee of Publication. (Vide *Transactions*, vol. xvii. p. 27.)

Resolved, That the Permanent Secretary hereafter and from this date be authorized to draw a warrant upon the Treasurer for the expenses incurred in his attendance upon each session of the Association, and that the Treasurer is hereby instructed to pay the same. (Vide *Transactions*, vol. xviii. p. 42.)

Resolved, That the faculties of the several medical colleges of

the United States be recommended to announce explicitly in their annual commencement circulars and advertisements that they will not receive certificates of time of study from irregular practitioners, and that they will not confer the degree upon any one who may acknowledge his intention to practise in accordance with any exclusive system. (*Vide Transactions*, vol. xix. p. 31.)

Resolved, That those gentlemen who desire to report on special subjects, and will pledge themselves to report at the next meeting, be requested to send their names, and the subjects on which they desire to report, to the Permanent Secretary. (*Vide Transactions*, vol. xix. p. 42.)

Resolved, That hereafter the necessary expenses for rent of hall for general meetings and rooms for sections to accommodate the annual meetings, and the necessary expenses for cards of membership, be paid out of the treasury of the Association. (*Vide Transactions*, vol. xix. p. 42.)

Resolved, That each State Medical Society be requested to prepare an annual register of all the regular practitioners of medicine in their respective States, giving the names of the colleges in which they may have graduated, and date of diploma or license. (*Vide Transactions*, vol. xx. p. 20.)

Resolved, That this Association recognizes specialties as proper and legitimate fields of practice.

Resolved, That specialists shall be governed by the same rules of professional etiquette as have been laid down for general practitioners.

Resolved, That it shall not be proper for specialists publicly to advertise themselves such, or to assume any title not specially granted by a regularly chartered college.

Resolved, That private handbills addressed to members of the medical profession, or by cards in medical journals, calling the attention of professional brethren to themselves as specialists, be declared in violation of the Code of Ethics of the American Medical Association. (*Vide Transactions*, vol. xx. p. 28.)

Resolved, That a Committee of one be appointed, residing at Washington, to render the Librarian of Congress such assistance as the interests of the Association may require. (*Vide Transactions*, vol. xx. p. 29.)

Whereas, The proper construction of Art. IV., Sec. 1, Code of Ethics, A. M. A., having been called for, relative to consultation with irregular practitioners who are graduates of regular schools:

Resolved, That said Art. IV., Sect. 1, Code of Ethics, excludes all such practitioners from recognition by the regular profession. (Vide *Transactions*, vol. xx. p. 30.)

Resolved, That if any member fail to reply for more than one year to the circular sent to him by the Committee of Publication, he shall forfeit his right to the volume, and it shall revert to the Association, to be sold to any applicant at the current rates. (Vide *Transactions*, vol. xxi. p. 30.)

Resolved, That the Committee of Arrangements for the next ensuing meeting of this Association, and for all meetings thereafter, be directed to prepare a list of members present on a separate roll, for convenience and accuracy in calling the ayes and nays when the same shall be demanded. (Vide *Transactions*, vol. xxi. p. 60.)

Resolved, That each year, until otherwise ordered, the President elect and the Permanent Secretary be directed to appeal, in the name of the Association, to the authorities of each State where no State Board of Health exists, urging them to establish such boards. (Vide *Transactions*, vol. xxvi. p. 50.)

Resolved, That the Permanent Secretary is hereby directed annually to report the names of States where boards of health exist, and also of those which decline to establish them; said report to form a part of the annual proceedings of the Association. (Vide *Transactions*, vol. xxvi. p. 50.)

Resolved, That members of the medical profession who in any way aid or abet the graduation of medical students in irregular or exclusive systems of medicine, are deemed thereby to violate the spirit of the ethics of the American Medical Association. (Vide *Transactions*, vol. xxvii. p. 48.)

Resolved 1. That the American Medical Association adopts the International Metric System, and will use it in its transactions. (Vide *Transactions*, vol. xxx. p. 44.)

2. Requests that those who present papers at its future meetings employ this system in their communications, or reprints thereof. (Vide *Transactions*, vol. xxx. p. 44.)

3. Requests the medical boards of the hospitals and dispensaries to adopt the Metric System in prescribing and recording cases; and that the Faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments. (Vide *Transactions*, vol. xxx. p. 44.)

Resolved, That the President and Secretary of this Association are directed to annually petition Congress to enact a law which

shall permit every person engaged in a scientific pursuit to import for his own use, free of duty, any one book or instrument appertaining to his special pursuit. (Vide *Transactions*, vol. xxx. p. 45.)

Resolved, That the above-named officers are further directed to urge the State Medical Societies and their auxiliary branches to aid this Association in accomplishing this purpose, by petitions to Congress, and by otherwise influencing Congressmen. (Vide *Transactions*, vol. xxx. p. 45.)

Decision by Judicial Council: A gentleman who is not in affiliation with a County, District, or State Medical Society, where such organizations exist, is *not* entitled to be registered as a permanent member upon the claim of having been a delegate from a body not now entitled to representation in this body. (Vide *Transactions*, vol. xxx. p. 57.)

CODE OF ETHICS
OF THE
AMERICAN MEDICAL ASSOCIATION,

ADOPTED MAY 1847.

DORE OF RTHUR

ANTHONY MICHOL ASSOCIATES

NEW YORK

CODE OF MEDICAL ETHICS.

OF THE DUTIES OF PHYSICIANS TO THEIR PATIENTS, AND OF THE OBLIGATIONS OF PATIENTS TO THEIR PHYSICIANS.

ART. I.—*Duties of physicians to their patients.*

§ 1. A physician should not only be ever ready to obey the calls of the sick, but his mind ought also to be imbued with the greatness of his mission, and the responsibility he habitually incurs in its discharge. These obligations are the more deep and enduring, because there is no tribunal other than his own conscience to adjudge penalties for carelessness or neglect. Physicians should, therefore, minister to the sick with due impressions of the importance of their office; reflecting that the ease, the health, and the lives of those committed to their charge, depend on their skill, attention, and fidelity. They should study, also, in their deportment, so to unite *tenderness* with *firmness*, and *condescension* with *authority*, as to inspire the minds of their patients with gratitude, respect, and confidence.

§ 2. Every case committed to the charge of a physician should be treated with attention, steadiness, and humanity. Reasonable indulgence should be granted to the mental imbecility and caprices of the sick. Secrecy and delicacy, when required by peculiar circumstances, should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted in their professional visits, should be used with discretion, and with the most scrupulous regard to fidelity and honor. The obligation of secrecy extends beyond the period of professional services;—none of the privacies of personal and domestic life, no infirmity of disposition or flaw of character observed during professional attendance should ever be divulged by the physician except when he is imperatively required to do so. The force and necessity of this obligation are indeed so great, that professional men have, under

certain circumstances, been protected in their observance of secrecy by courts of justice.

§ 3. Frequent visits to the sick are in general requisite, since they enable the physician to arrive at a more perfect knowledge of the disease—to meet promptly every change which may occur, and also tend to preserve the confidence of the patient. But unnecessary visits are to be avoided, as they give useless anxiety to the patient, tend to diminish the authority of the physician, and render him liable to be suspected of interested motives.

§ 4. A physician should not be forward to make gloomy prognostications, because they savor of empiricism, by magnifying the importance of his services in the treatment or cure of the disease. But he should not fail, on proper occasions, to give to the friends of the patient timely notice of danger when it really occurs; and even to the patient himself, if absolutely necessary. This office, however, is so peculiarly alarming when executed by him, that it ought to be declined whenever it can be assigned to any other person of sufficient judgment and delicacy. For the physician should be the minister of hope and comfort to the sick; that, by such cordials to the drooping spirit, he may smooth the bed of death, revive expiring life, and counteract the depressing influence of those maladies which often disturb the tranquillity of the most resigned in their last moments. The life of a sick person can be shortened not only by the acts, but also by the words or the manner of a physician. It is, therefore, a sacred duty to guard himself carefully in this respect, and to avoid all things which have a tendency to discourage the patient and to depress his spirits.

§ 5. A physician ought not to abandon a patient because the case is deemed incurable; for his attendance may continue to be highly useful to the patient, and comforting to the relatives around him, even in the last period of a fatal malady, by alleviating pain and other symptoms, and by soothing mental anguish. To decline attendance, under such circumstances, would be sacrificing to fanciful delicacy and mistaken liberality, that moral duty, which is independent of, and far superior to, all pecuniary consideration.

§ 6. Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and more enlarged views in practice.

§ 7. The opportunity which a physician not unfrequently enjoys of promoting and strengthening the good resolutions of his patients, suffering under the consequences of vicious conduct, ought never

to be neglected. His counsels, or even remonstrances, will give satisfaction, not offence, if they be proffered with politeness, and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

ART. II.—*Obligations of patients to their physicians.*

§ 1. The members of the medical profession, upon whom is enjoined the performance of so many important and arduous duties towards the community, and who are required to make so many sacrifices of comfort, ease, and health, for the welfare of those who avail themselves of their services, certainly have a right to expect and require, that their patients should entertain a just sense of the duties which they owe to their medical attendants.

§ 2. The first duty of a patient is to select as his medical adviser one who has received a regular professional education. In no trade or occupation do mankind rely on the skill of an untaught artist; and in medicine, confessedly the most difficult and intricate of the sciences, the world ought not to suppose that knowledge is intuitive.

§ 3. Patients should prefer a physician whose habits of life are regular, and who is not devoted to company, pleasure, or to any pursuit incompatible with his professional obligations. A patient should, also, confide the care of himself and family, as much as possible, to one physician; for a medical man who has become acquainted with the peculiarities of constitution, habits, and predispositions of those he attends, is more likely to be successful in his treatment than one who does not possess that knowledge.

A patient who has thus selected his physician should always apply for advice in what may appear to him trivial cases, for the most fatal results often supervene on the slightest accidents. It is of still more importance that he should apply for assistance in the forming stage of violent diseases; it is to a neglect of this precept that medicine owes much of the uncertainty and imperfection with which it has been reproached.

§ 4. Patients should faithfully and unreservedly communicate to their physician the supposed cause of their disease. This is the more important, as many diseases of a mental origin simulate those depending on external causes, and yet are only to be cured by ministering to the mind diseased. A patient should never be afraid of thus making his physician his friend and adviser; he should always

bear in mind that a medical man is under the strongest obligations of secrecy. Even the female sex should never allow feelings of shame or delicacy to prevent their disclosing the seat, symptoms, and causes of complaints peculiar to them. However commendable a modest reserve may be in the common occurrences of life, its strict observance in medicine is often attended with the most serious consequences, and a patient may sink under a painful and loathsome disease, which might have been readily prevented had timely intimation been given to the physician.

§ 5. A patient should never weary his physician with a tedious detail of events or matters not appertaining to his disease. Even as relates to his actual symptoms, he will convey much more real information by giving clear answers to interrogatories, than by the most minute account of his own framing. Neither should he obtrude upon his physician the details of his business nor the history of his family concerns.

§ 6. The obedience of a patient to the prescriptions of his physician should be prompt and implicit. He should never permit his own crude opinions as to their fitness to influence his attention to them. A failure in one particular may render an otherwise judicious treatment dangerous, and even fatal. This remark is equally applicable to diet, drink, and exercise. As patients become convalescent, they are very apt to suppose that the rules prescribed for them may be disregarded, and the consequence, but too often, is a relapse. Patients should never allow themselves to be persuaded to take any medicine whatever, that may be recommended to them by the self-constituted doctors and doctresses who are so frequently met with, and who pretend to possess infallible remedies for the cure of every disease. However simple some of their prescriptions may appear to be, it often happens that they are productive of much mischief, and in all cases they are injurious, by contravening the plan of treatment adopted by the physician.

§ 7. A patient should, if possible, avoid even the *friendly visits of a physician* who is not attending him—and when he does receive them, he should never converse on the subject of his disease, as an observation may be made, without any intention of interference, which may destroy his confidence in the course he is pursuing, and induce him to neglect the directions prescribed to him. A patient should never send for a consulting physician without the express consent of his own medical attendant. It is of great importance that physicians should act in concert; for, although their modes

of treatment may be attended with equal success when employed singly, yet conjointly they are very likely to be productive of disastrous results.

§ 8. When a patient wishes to dismiss his physician, justice and common courtesy require that he should declare his reasons for so doing.

§ 9. Patients should always, when practicable, send for their physician in the morning, before his usual hour of going out; for, by being early aware of the visits he has to pay during the day, the physician is able to apportion his time in such a manner as to prevent an interference of engagements. Patients should also avoid calling on their medical adviser unnecessarily during the hours devoted to meals or sleep. They should always be in readiness to receive the visits of their physician, as the detention of a few minutes is often of serious inconvenience to him.

§ 10. A patient should, after his recovery, entertain a just and enduring sense of the value of the services rendered him by his physician; for these are of such a character, that no mere pecuniary acknowledgment can repay or cancel them.

OF THE DUTIES OF PHYSICIANS TO EACH OTHER, AND TO THE PROFESSION AT LARGE.

ART. I.—*Duties for the support of professional character.*

§ 1. Every individual, on entering the profession, as he becomes thereby entitled to all its privileges and immunities, incurs an obligation to exert his best abilities to maintain its dignity and honor, to exalt its standing, and to extend the bounds of its usefulness. He should, therefore, observe strictly such laws as are instituted for the government of its members; should avoid all contumelious and sarcastic remarks relative to the faculty as a body; and while, by unwearied diligence, he resorts to every honorable means of enriching the science, he should entertain a due respect for his seniors, who have, by their labors, brought it to the elevated condition in which he finds it.

§ 2. There is no profession, from the members of which greater purity of character, and a higher standard of moral excellence are required, than the medical; and to attain such eminence is a duty every physician owes alike to his profession and to his patients. It is due to the latter, as without it he cannot command their respect and confidence, and to both, because no scientific attainments can

compensate for the want of correct moral principles. It is also incumbent upon the faculty to be temperate in all things, for the practice of physic requires the unremitting exercise of a clear and vigorous understanding; and, on emergencies, for which no professional man should be unprepared, a steady hand, an acute eye, and an unclouded head may be essential to the well-being, and even to the life, of a fellow-creature.

§ 3. It is derogatory to the dignity of the profession to resort to public advertisements, or private cards, or handbills, inviting the attention of individuals affected with particular diseases—publicly offering advice and medicine to the poor gratis, or promising radical cures; or to publish cases and operations in the daily prints, or suffer such publications to be made; to invite laymen to be present at operations, to boast of cures and remedies, to adduce certificates of skill and success, or to perform any other similar acts. These are the ordinary practices of empirics, and are highly reprehensible in a regular physician.

§ 4. Equally derogatory to professional character is it for a physician to hold a patent for any surgical instrument or medicine; or to dispense a secret *nostrum*, whether it be the composition or exclusive property of himself or of others. For, if such nostrum be of real efficacy, any concealment regarding it is inconsistent with beneficence and professional liberality; and if mystery alone give it value and importance, such craft implies either disgraceful ignorance or fraudulent avarice. It is also reprehensible for physicians to give certificates attesting the efficacy of patent or secret medicines, or in any way to promote the use of them.

ART. II.—*Professional services of physicians to each other.*

§ 1. All practitioners of medicine, their wives, and their children while under the paternal care, are entitled to the gratuitous services of any one or more of the faculty residing near them, whose assistance may be desired. A physician afflicted with disease is usually an incompetent judge of his own case; and the natural anxiety and solicitude which he experiences at the sickness of a wife, a child, or any one who, by the ties of consanguinity, is rendered peculiarly dear to him, tend to obscure his judgment, and produce timidity and irresolution in his practice. Under such circumstances, medical men are peculiarly dependent upon each other, and kind offices and professional aid should always be cheerfully

and gratuitously afforded. Visits ought not, however, to be obtruded officiously; as such unasked civility may give rise to embarrassment, or interfere with that choice on which confidence depends. But, if a distant member of the faculty, whose circumstances are affluent, request attendance, and an honorarium be offered, it should not be declined; for no pecuniary obligation ought to be imposed, which the party receiving it would wish not to incur.

ART. III.—*Of the duties of physicians as respects vicarious offices.*

§ 1. The affairs of life, the pursuit of health, and the various accidents and contingencies to which a medical man is peculiarly exposed, sometimes require him temporarily to withdraw from his duties to his patients, and to request some of his professional brethren to officiate for him. Compliance with this request is an act of courtesy, which should always be performed with the utmost consideration for the interest and character of the family physician, and when exercised for a short period, all the pecuniary obligations for such service should be awarded to him. But if a member of the profession neglect his business in quest of pleasure and amusement, he cannot be considered as entitled to the advantages of the frequent and long-continued exercise of this fraternal courtesy, without awarding to the physician who officiates, the fees arising from the discharge of his professional duties.

In obstetrical and important surgical cases, which give rise to unusual fatigue, anxiety, and responsibility, it is just that the fees accruing therefrom should be awarded to the physician who officiates.

ART. IV.—*Of the duties of physicians in regard to consultations.*

§ 1. A regular medical education furnishes the only presumptive evidence of professional abilities and acquirements, and ought to be the only acknowledged right of an individual to the exercise and honors of his profession. Nevertheless, as in consultations the good of the patient is the sole object in view and this is often dependent on personal confidence, no intelligent regular practitioner, who has a license to practise from some medical board of known and acknowledged respectability, recognized by this Association, and who is in good moral and professional standing in the place in which he resides, should be fastidiously excluded from fellow-

ship, or his aid refused in consultation, when it is requested by the patient. But no one can be considered as a regular practitioner or a fit associate in consultation, whose practice is based on an exclusive dogma, to the rejection of the accumulated experience of the profession, and of the aids actually furnished by anatomy, physiology, pathology, and organic chemistry.

§ 2. In consultations, no rivalship or jealousy should be indulged; candor, probity, and all due respect should be exercised towards the physician having charge of the case.

§ 3. In consultations, the attending physician should be the first to propose the necessary questions to the sick; after which the consulting physician should have the opportunity to make such further inquiries of the patient as may be necessary to satisfy him of the true character of the case. Both physicians should then retire to a private place for deliberation; and the one first in attendance should communicate the directions agreed upon to the patient or his friends, as well as any opinions which it may be thought proper to express. But no statement or discussion of it should take place before the patient or his friends, except in the presence of all the faculty attending, and by their common consent; and no *opinions* or *prognostications* should be delivered which are not the result of previous deliberation and concurrence.

§ 4. In consultations, the physician in attendance should deliver his opinion first; and when there are several consulting, they should deliver their opinions in the order in which they have been called in. No decision, however, should restrain the attending physician from making such variations in the mode of treatment as any subsequent unexpected change in the character of the case may demand. But such variation, and the reasons for it, ought to be carefully detailed at the next meeting in consultation. The same privilege belongs also to the consulting physician if he is sent for in an emergency, when the regular attendant is out of the way, and similar explanations must be made by him at the next consultation.

§ 5. The utmost punctuality should be observed in the visits of physicians when they are to hold consultation together, and this is generally practicable, for society has been considerate enough to allow the plea of a professional engagement to take precedence of all others, and to be an ample reason for the relinquishment of any present occupation. But as professional engagements may sometimes interfere, and delay one of the parties, the physician who first arrives should wait for his associate a reasonable period, after

which the consultation should be considered as postponed to a new appointment. If it be the attending physician who is present, he will of course see the patient and prescribe; but if it be the consulting one, he should retire, except in case of emergency, or when he has been called from a considerable distance, in which latter case he may examine the patient, and give his opinion in *writing*, and *under seal*, to be delivered to his associate.

§ 6. In consultations, theoretical discussions should be avoided, as occasioning perplexity and loss of time. For there may be much diversity of opinion concerning speculative points, with perfect agreement in those modes of practice which are founded, not on hypothesis, but on experience and observation.

§ 7. All discussions in consultation should be held as secret and confidential. Neither by words nor manner should any of the parties to a consultation assert or insinuate that any part of the treatment pursued did not receive his assent. The responsibility must be equally divided between the medical attendants—they must equally share the credit of success as well as the blame of failure.

§ 8. Should an irreconcilable diversity of opinion occur when several physicians are called upon to consult together, the opinion of the majority should be considered as decisive; but if the numbers be equal on each side, then the decision should rest with the attending physician. It may, moreover, sometimes happen that two physicians cannot agree in their views of the nature of a case, and the treatment to be pursued. This is a circumstance much to be deplored, and should always be avoided, if possible, by mutual concessions, as far as they can be justified by a conscientious regard for the dictates of judgment. But in the event of its occurrence, a third physician should, if practicable, be called to act as umpire; and, if circumstances prevent the adoption of this course, it must be left to the patient to select the physician in whom he is most willing to confide. But, as every physician relies upon the rectitude of his judgment, he should, when left in the minority, politely and consistently retire from any further deliberation in the consultation, or participation in the management of the case.

§ 9. As circumstances sometimes occur to render a *special consultation* desirable, when the continued attendance of two physicians might be objectionable to the patient, the member of the faculty whose assistance is required in such cases should sedulously guard against all future unsolicited attendance. As such consultations

require an extraordinary portion both of time and attention, at least a double honorarium may be reasonably expected.

§ 10. A physician who is called upon to consult, should observe the most honorable and scrupulous regard for the character and standing of the practitioner in attendance; the practice of the latter, if necessary, should be justified as far as it can be, consistently with a conscientious regard for truth, and no hint or insinuation should be thrown out which could impair the confidence reposed in him, or affect his reputation. The consulting physician should also carefully refrain from any of those extraordinary attentions or assiduities which are too often practised by the dishonest for the base purpose of gaining applause, or ingratiating themselves into the favor of families and individuals.

ART. V.—*Duties of physicians in cases of interference.*

§ 1. Medicine is a liberal profession, and those admitted into its ranks should found their expectations of practice upon the extent of their qualifications, not on intrigue or artifice.

§ 2. A physician, in his intercourse with a patient under the care of another practitioner, should observe the strictest caution and reserve. No meddling inquiries should be made—no disingenuous hints given relative to the nature and treatment of his disorder; nor any course of conduct pursued that may directly or indirectly tend to diminish the trust reposed in the physician employed.

§ 3. The same circumspection and reserve should be observed when, from motives of business or friendship, a physician is prompted to visit an individual who is under the direction of another practitioner. Indeed, such visits should be avoided, except under peculiar circumstances; and when they are made, no particular inquiries should be instituted relative to the nature of the disease, or the remedies employed, but the topics of conversation should be as foreign to the case as circumstances will admit.

§ 4. A physician ought not to take charge of or prescribe for a patient who has recently been under the care of another member of the faculty in the same illness, except in cases of sudden emergency, or in consultation with the physician previously in attendance, or when the latter has relinquished the case, or been regularly notified that his services are no longer desired. Under such circumstances, no unjust and illiberal insinuations should be thrown out in relation to the conduct or practice previously pursued, which should

be justified as far as candor and regard for truth and probity will permit; for it often happens that patients become dissatisfied when they do not experience immediate relief, and, as many diseases are naturally protracted, the want of success, in the first stage of treatment, affords no evidence of a lack of professional knowledge and skill.

§ 5. When a physician is called to an urgent case, because the family attendant is not at hand, he ought, unless his assistance in consultation be desired, to resign the care of the patient to the latter immediately on his arrival.

§ 6. It often happens in cases of sudden illness, or of recent accidents and injuries, owing to the alarm and anxiety of friends, that a number of physicians are simultaneously sent for. Under these circumstances, courtesy should assign the patient to the first who arrives, who should select from those present any additional assistance that he may deem necessary. In all such cases, however, the practitioner who officiates should request the family physician, if there be one, to be called, and, unless his further attendance be requested, should resign the case to the latter on his arrival.

§ 7. When a physician is called to the patient of another practitioner, in consequence of the sickness or absence of the latter, he ought, on the return or recovery of the regular attendant and with the consent of the patient, to surrender the case.

[The expression, "patient of another practitioner," is understood to mean a patient who may have been under the charge of another practitioner at the time of the attack of sickness, or departure from home of the latter, or who may have called for his attendance during his absence or sickness, or in any other manner given it to be understood that he regarded the said physician as his regular medical attendant.]

§ 8. A physician, when visiting a sick person in the country, may be desired to see a neighboring patient who is under the regular direction of another physician, in consequence of some sudden change or aggravation of symptoms. The conduct to be pursued on such an occasion is to give advice adapted to present circumstances; to interfere no further than is absolutely necessary with the general plan of treatment; to assume no future direction unless it be expressly desired; and, in this last case, to request an immediate consultation with the practitioner previously employed.

§ 9. A wealthy physician should not give advice *gratis* to the affluent; because his doing so is an injury to his professional bre-

thren. The office of a physician can never be supported as an exclusively beneficent one; and it is defrauding, in some degree, the common funds for its support, when fees are dispensed with which might justly be claimed.

§ 10. When a physician who has been engaged to attend a case of midwifery is absent, and another is sent for, if delivery is accomplished during the attendance of the latter, he is entitled to the fee, but should resign the patient to the practitioner first engaged.

ART. VI.—*Of differences between physicians.*

§ 1. Diversity of opinion and opposition of interest may, in the medical as in other professions, sometimes occasion controversy and even contention. Whenever such cases unfortunately occur, and cannot be immediately terminated, they should be referred to the arbitration of a sufficient number of physicians or a *court-medical*.

§ 2. As peculiar reserve must be maintained by physicians towards the public, in regard to professional matters, and as there exist numerous points in medical ethics and etiquette through which the feelings of medical men may be painfully assailed in their intercourse with each other, and which cannot be understood or appreciated by general society, neither the subject-matter of such differences nor the adjudication of the arbitrators should be made public, as publicity in a case of this nature may be personally injurious to the individuals concerned, and can hardly fail to bring discredit on the faculty.

ART. VII.—*Of pecuniary acknowledgments.*

Some general rules should be adopted by the faculty, in every town or district, relative to *pecuniary acknowledgments* from their patients; and it should be deemed a point of honor to adhere to these rules with as much uniformity as varying circumstances will admit.

OF THE DUTIES OF THE PROFESSION TO THE PUBLIC, AND OF THE OBLIGATIONS OF THE PUBLIC TO THE PROFESSION.

ART. I.—*Duties of the profession to the public.*

§ 1. As good citizens, it is the duty of physicians to be ever vigilant for the welfare of the community, and to bear their part in sustaining its institutions and burdens; they should also be ever

ready to give counsel to the public in relation to matters especially appertaining to their profession, as on subjects of medical police, public hygiene, and legal medicine. It is their province to enlighten the public in regard to quarantine regulations; the location, arrangement, and dietaries of hospitals, asylums, schools, prisons, and similar institutions; in relation to the medical police of towns, as drainage, ventilation, etc.; and in regard to measures for the prevention of epidemic and contagious diseases; and when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of the suffering, even at the jeopardy of their own lives.

§ 2. Medical men should also be always ready, when called on by the legally constituted authorities, to enlighten coroners' inquests and courts of justice, on subjects strictly medical—such as involve questions relating to sanity, legitimacy, murder by poisons or other violent means, and in regard to the various other subjects embraced in the science of Medical Jurisprudence. But in these cases, and especially where they are required to make a *post-mortem* examination, it is just, in consequence of the time, labor, and skill required, and the responsibility and risk they incur, that the public should award them a proper honorarium.

§ 3. There is no profession by the members of which eleemosynary services are more liberally dispensed than the medical, but justice requires that some limits should be placed to the performance of such good offices. Poverty, professional brotherhood, and certain of the public duties referred to in the first section of this article, should always be recognized as presenting valid claims for gratuitous services; but neither institutions endowed by the public or by rich individuals, societies for mutual benefit, for the insurance of lives or for analogous purposes, nor any profession or occupation, can be admitted to possess such privilege. Nor can it be justly expected of physicians to furnish certificates of inability to serve on juries, to perform militia duty, or to testify to the state of health of persons wishing to insure their lives, obtain pensions, or the like, without a pecuniary acknowledgment. But to individuals in indigent circumstances, such professional services should always be cheerfully and freely accorded.

§ 4. It is the duty of physicians, who are frequent witnesses of the enormities committed by quackery, and the injury to health and even destruction of life caused by the use of quack medicines, to enlighten the public on these subjects, to expose the injuries

sustained by the unwary from the devices and pretensions of artful empirics and impostors. Physicians ought to use all the influence which they may possess, as professors in Colleges of Pharmacy, and by exercising their option in regard to the shops to which their prescriptions shall be sent, to discourage druggists and apothecaries from vending quack or secret medicines, or from being in any way engaged in their manufacture and sale.

ART. II.—*Obligations of the public to physicians.*

§ 1. The benefits accruing to the public, directly and indirectly, from the active and unwearied beneficence of the profession, are so numerous and important, that physicians are justly entitled to the utmost consideration and respect from the community. The public ought likewise to entertain a just appreciation of medical qualifications; to make a proper discrimination between true science and the assumptions of ignorance and empiricism; to afford every encouragement and facility for the acquisition of medical education—and no longer to allow the statute-books to exhibit the anomaly of exacting knowledge from physicians, under a liability to heavy penalties, and of making them obnoxious to punishment for resorting to the only means of obtaining it.

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The Constitution having been amended, the same officers presided also at Boston. (*Vide Transactions*, vol. xv. p. 50.)

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PRIZE ESSAY.

A CONSIDERATION

OF

CERTAIN FORMS OF PRIMARY AND (LOCAL)
SECONDARY DEGENERATION

OF THE

LATERAL COLUMNS OF THE SPINAL CORD,

WITH ESPECIAL REFERENCE TO AN INFANTILE
RARE FORM.

BY

ALLAN McLANE HAMILTON, M.D.,

Successful Competitor in 1870 for the "First Faculty" and Harsen Prizes, awarded by the
College of Physicians and Surgeons, New York City; Consulting Neurologist to
N. Y. City Insane and Idiot Asylums on Randall's Island;
Visiting Physician to Hospital for
Epileptics, Paralytics, etc.

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INTRODUCTION.

IN this Essay it will be my purpose to consider certain forms of nervous trouble dependent in one case upon what may be supposed to be arrest of development, or primary degeneration of the lateral columns of the spinal cord; or in the other, disease of these parts; such disease being directly dependent upon the extension of morbid processes from contiguous parts.

In one instance the resulting disease may be called *congenital* or *primary*, and in the other secondary (including transverse ascending and descending degeneration).

I shall not speak, except incidentally, of a form of secondary degeneration consecutive to cerebral disease seated ordinarily in the internal capsule, or some part of the motor tract; but prefer to devote my remarks, at present, entirely to the purely local affections, and especially to several undescribed and rare varieties, some of which have been only casually alluded to or hinted at as possibilities by Charcot,¹ Richter,² and O. Berger.³

HISTORY.

The early history of disease of the lateral columns of the spinal cord presents little that is important, and few data that are trustworthy; and it is impossible to find more than one or two examples of well-defined cases of this kind.

Olivier,⁴ whose work is, even to this day, one of the best upon the subject of spinal disease, described a case which is as perfect as any of those since reported by modern observers; and this was as far back as 1833.

There seems to have been a long interval of quiescence before Tuerck,⁵ in 1850 and 1851, investigated and wrote upon second-

¹ Gaz. Hebdom., 1865, No. 7.

² Deutsches Archiv für Klin. Med., 1876, p. 365.

³ Deutsches Zeitschrift für Prakt. Med., 1877, 3, 5, 6.

⁴ Traité du Malad. de la Moelle épinière, Paris, 1837, t. ii.

⁵ Quoted by Erb (see bibliography).

ary degenerations. His works have formed the basis of all recent study.

After twelve years the subject was revived by the Germans and French; among whom were Leyden (1863), Bouchard (1866), Charcot (1865), Joffroy (1869), Voisin, (1869), Gombault (1871), and more recently by Fleischig (1876), Westphal, Erb, Bétons, Seguin, Berger, Schulz, Richter, Betous, Kussmaul, Althaus, Gray, Hamilton, and Mills.

For some time, in fact until about ten years ago, the clinical and pathological characteristics of disease of the lateral columns of the spinal cord were not clearly recognized; but to the French belongs the credit of having laid the foundation for the work of developing the subject, especially of primary disease of these parts of the cord.

Charcot's earliest investigations were made upon a case presenting hysterical contractures of the four extremities with sclerosis of the lateral columns as a post-mortem appearance.

At this time and subsequently (1869), irregular cases presenting atrophy were reported. Charcot and Joffroy brought forward a supposed case of progressive muscular atrophy connected with sclerosis of the antero-lateral columns; and Voisin one of meningo-myelitis with the same pathological changes.

For some time a period of chaos prevailed, out of which the possible clinical recognition of three or four diseases was announced.

Before this time, disease of the lateral columns of the spinal cord was supposed to be either anomalous progressive muscular atrophy, or locomotor ataxia. Later on the existence of a disease called by Charcot "*sclerose laterale amyotrophique*," in which the antero-lateral columns were involved, and in which there was atrophy with contractures, was recognized, and still later a form of disease unattended by atrophy was described, and the seat of the lesion located in the posterior part of the lateral columns.

Tuerck (1856) had many years before found limited lesions of this kind, but did not appreciate their significance; so after all Charcot may be said to have established the pathological nature of the affection.

The honor of the first recognition of the clinical features of this disease most certainly belongs to our own countryman,

Seguin,¹ who in 1873, under the title of "Tetanoid Pseudo-paraplegia," presented five cases which exhibited all the features of those more recently reported by other observers, although Seguin did not believe the affection to be essentially connected with paralysis, and rather considered it as a secondary affection.

Erb,² in 1875, still further described the primary trouble, and in 1876 Charcot gave to the classical collection of symptoms the name of "tabes dorsal spasmodique," which was afterwards improved by Erb, who employed the more appropriate term, "spasmodic spinal paralysis" (*spastische spinallähmung*).

The subsequent writings of other observers have added but little that is new to what Charcot and Erb have already said. Among these are cases brought forward by Erb, Berger, Richter, Schulz, Leyden, Von Stofella, and Von der Velden in Germany, Althaus in England, Charcot and Betons in France, and Gray and Hamilton in America.

CLASSIFICATION OF DISEASES OF THE LATERAL COLUMNS OF THE SPINAL CORD.

1. Congenital non-development, or early degeneration of the lateral columns. Infantile spasmodic spinal paralysis (probably the "*spastischen spinallähmung bei Kleinen Kindern*" of Erb).³
2. Functional neuroses (*Störungen* neurosis of Berger).⁴
3. Hysterical spasmodic spinal paralysis.
4. Adult spasmodic spinal paralysis.
- 5.⁵ Secondary degeneration (of local origin).
 - a. As a consequence of spinal disease.
 - b. As a consequence of extra-spinal disease.

Degeneration of the lateral columns may then be either primary or secondary; due in the first instance to what I believe to be imperfect development, ante-natal disease or early degeneration of the lateral columns, idiopathic when it occurs later in life; or in the other (secondary degeneration) to the ascending, descending, or transverse extension of disease from other parts.

¹ Archives for Scientific and Prac. Med., vol. i. No. 2.

² Berlin. Klin. Woch., 1875, No. 26.

³ Memorabilien Monastshefte für rat. prakt. äertze, Jahrg. 12, Heft. 1877, p. 529.

⁴ Centralblatt, p. 13, 1878.

⁵ Secondary degeneration from cerebral disease is intentionally omitted.

I think, therefore, that a more systematic division can be made than that which is usually followed. This is imperative; since irregular forms have been found to exist, and so far, have not been assigned to their proper place.

1. Is, of course, an affection present at birth, or commencing very soon after, and has continued through life in all the cases so far observed.

2. Is not confined to any age, but so far the reported cases have been among adults. It has its analogue in functional paralysis and disturbances of sensation dependent upon anæmia in other parts of the cord.

3. A disease of adult life, and so far has been seen only among women.

4. A disease of adult life, rarely beginning before the twelfth year, and often incurable.

5. Secondary degeneration of local origin, not necessarily confined to adult life, as it may follow traumatism, vertebral disease; or, on the other hand, seemingly idiopathic disease of other parts.

Among the causes of the first form of No. 5 may be mentioned caries or rachitis with lateral curvature, concussion of the cord with resulting myelitis of the lateral columns, the existence of a low grade of myelitis or meningo-myelitis, as described by Voisin, or finally as a result of the existence of tumors.

PATHOLOGICAL TOPOGRAPHY OF THE SPINAL CORD. (Lateral Columns.)

Before going further it will be well to briefly sketch out the pathological topography of the spinal cord with reference more especially to the relations of the lateral column to other parts.

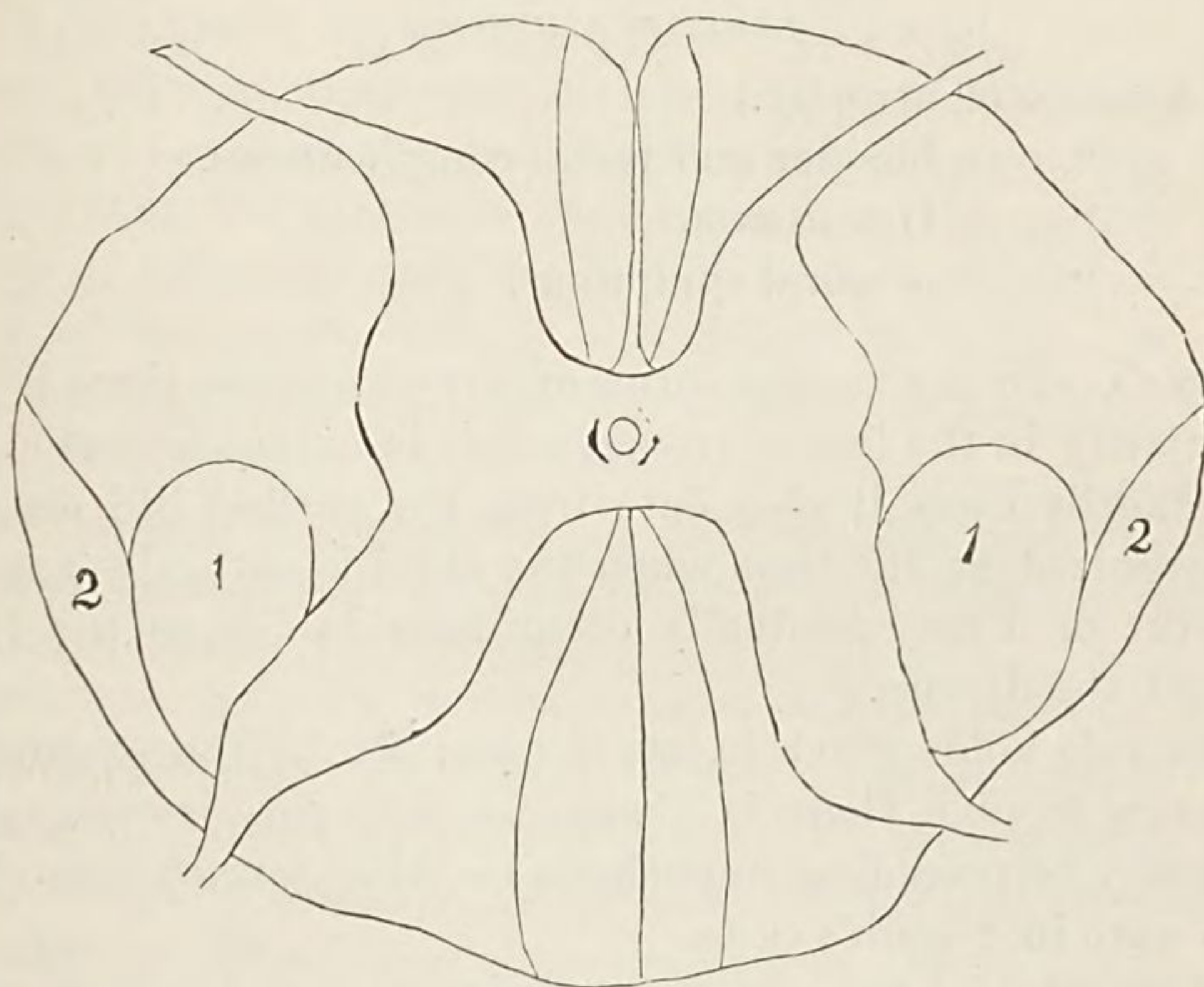
For this purpose I will use the admirable plate of Fleischig, slightly modified to show the limitation of the various parts of the lateral columns, and the districts that are involved (Fig. 1).

So far as our present knowledge is concerned, the areas numbered 1, 1, and 2, 2, are those which interest us as the probable seat of the disease; the former being the so-called "crossed-pyramidal columns," which include fibres coming from either hemisphere after decussation in the pyramids, and are the seat of descending disease, whether originating in the motor tracts of the corpora striata, or at some point in the superior part of the cord. The latter 2, 2, are the direct cerebellar columns and

are always involved in primary disease, but never in the descending cerebral form except in the lumbar region.

In the primary affection, or in the *local* secondary affections, both 1 and 2 are ordinarily involved; so that the degenerative process extends to the periphery and occupies a large extent of territory.

Fig. 1.



The anterior part of the lateral columns is very rarely affected alone; but usually the anterior cornua are the conjoint seat of degeneration—in which case the symptoms assume a new character, atrophy being, as I have before said, a prominent feature.

In both primary and secondary troubles of local origin, the pathological distinctions cannot be made with absolute accuracy, as the destruction of other parts of the cord may enter, at some time, into the history of the disease; but it may be assumed that, sooner or later, the whole posterior or interior parts of the lateral columns, but more often the former, are affected.

GENERAL CHARACTERISTICS OF DISEASES OF THE LATERAL COLUMNS OF THE SPINAL CORD.

Symptomatology.—Let us rapidly group the positive and negative symptoms of disease of the lateral columns of the spinal cord together, and afterwards refer in detail to their methods of appearance and special characteristics.

POSITIVE SYMPTOMS.

1. Paresis with rigidity and contractures; spastic gait; conserved surface sensibility.
2. An increase of all forms of reflex irritability—especially that of the tendons.
3. Hyperæsthesia (of initial and late stages).

NEGATIVE SYMPTOMS.

4. Absence of atrophy.
5. “ bladder and rectal complications.
6. “ true ataxia.
7. “ cerebral symptoms.

Paresis.—In the various forms of lateral disease, there is great irregularity in the loss of power, either in extent or period. In the infantile cases it may date from the earliest life, and only be recognized at the time when the child is naturally expected to walk; or it may gradually occur later in life as the initial stage of the disease.

This rule holds good in every case; for in the examples of secondary trouble, there is always an early paresis even though there may be preceding anæsthesia or other sensory troubles as there were in Seguin's cases.

Let us consider the paresis in a primary case developing after the thirtieth year.

The early signs affecting power are manifested in a variety of ways—the individual easily tires; a short walk produces a sense of fatigue referred to the flexures of the knees. Should the upper extremities be those first affected, he finds himself unable to grasp his tools as forcibly as he once did. If he is a clerk, his pen is used clumsily and its point is not kept in contact with the paper, but traverses the lines unsteadily, so that the writing is exceedingly tremulous and without character. He leaves his bed with difficulty, and his legs are used awkwardly; and as the day advances he feels more disinclined to walk or move about. The paresis becomes more decided and is connected with spastic rigidity. Later on, as it grows more profound, it resembles, to some extent, certain well-known forms of paralysis—but there is no anæsthesia.

This similarity is very decided in the hemiplegic forms. The loss of power, however, is likely to affect the different

members in a decidedly irregular manner, perhaps appearing in one leg first, then the other, and finally the arms; or it may affect one leg, then the arms of the same side, and then those of the other side. The limbs may be the seat of paresis which varies on both sides.

Although sclerosis of the lateral columns on one side only giving rise to a hemiplegia of spinal origin (such as has been especially alluded to by Berger) may occasionally occur, it will be seen from an inspection of reported cases, that in primary disease, and even in the transverse varieties of secondary degeneration, that the paresis is paraplegiform. The paresis is suggestive of extensor paralysis; and in the supine posture in the advanced stages, the patient is unable to raise his heels more than four or five inches from the surface upon which he may be lying, and in most cases not even this.

Combined with the paresis is a certain amount of rigidity which exists in every case, and varies from a simple spastic condition to absolute contracture.

This is a constant symptom, and is, perhaps, one of the most marked indications of lateral trouble to be met with. It is gradual in its method of appearance, is rarely universal; but in nearly every case of either primary or secondary disease, affects both extremities.

The earliest evidences of motor irritation are shown in the muscles of the lower extremities, notably in a certain spastic stiffness of those of the calf, and of the posterior and inner aspects of the thighs.

As a result of this trouble, there is great rigidity when passive movements of the knee and ankle-joints are made; and when any attempt at locomotion or other movements requiring use of the feet are essayed, these members become extended and quite rigid.

This, like the tendon-reflex, seems, in my opinion, to be increased by warmth (though in Kussmaul's case the reverse was observed), and it is especially troublesome when the upright position is assumed. When the knee is bent and the leg flexed, it will be found that the hamstring tendons stand out as rigid cords, while there is more or less resistance to flexion of this kind.

The gait of patients suffering from disease of the lateral columns, has been called by the Germans "spasticher-gang;"

and its peculiarity depends upon the combination of paresis and muscular rigidity—the latter being increased by the act of putting the foot to the ground.

In the beginning, as a result of the loss of power, the patient constantly stubs his toes which come in contact with any little elevation which may be in the floor or surface upon which he walks. Afterwards the embarrassment is increased by the spasms which involve the muscles upon the posterior aspect of the leg; and there occurs a species of talipes equinus, the toes, however, being usually flexed.

The patient from the first walks with difficulty; his feet becoming interlocked and entangled, and through a rigid contraction of the thighs, the knees are brought together; and as a result of friction their internal surfaces will be found to be callous and roughened. The knees are often *sunken*, so that the anterior leg or thigh surfaces form almost an obtuse angle. In the advanced forms of disease of this kind, these deformities of extension and adduction become very conspicuous, and the patient becomes so helpless that he requires a cane or crutches.

In the upper extremities, deformities and spastic rigidity are neither so markedly nor constantly shown, although in rare cases terrible distortions of the variety described by Charcot¹ and Strauss² as the form “*en plaque*,” are sometimes seen. The arm is then drawn to the side, the elbow and fingers flexed, and there is complete loss of power. As a later result of continued and persistent contractures of the muscles ending in the tendo Achillis, and in other tendons, there may result conditions either of talipes equinus, valgus and varus, and the patient's *efforts* to walk cause him very great distress as his weight comes upon his distorted foot.

A peculiar deformity alluded to by Charcot,³ and observed by myself⁴ is the abdominal contracture which gives rise to a very pronounced anterior curvature of the body; and as a result there is a protrudent abdomen and a deep fissure below the lower border of the ribs. (Fig. 2.)

In such cases there is usually some local wasting of the muscles of the back, just as there would be in any muscles subjected

¹ Leçons sur les Maladies du Syst. N., 1872-3.

² Les Contractures, Paris, 1875, p. 16.

³ Leçons sur les Maladies du Syst. N., 1878.

⁴ Medical Record, October 28, 1878, p. 323.

to disease, and *kept* upon a stretch for a long period of time, but in no respect is there true atrophy from deficient central innervation.

The head is never affected by motor trouble; and there is no paresis of the muscles of the neck, although in an exceptional case, presently to be described, there was paresis of the intercostals arising probably as a result of degeneration of the cervical lateral columns.

The appearance and advance of these motor disturbances vary of course; and I will reserve the discussion of such peculiarities for another part of this essay.

Increased Reflex.—One of the most marked distinguishing features of disease of the lateral columns is an exaggeration of reflex action which is evinced in several ways. Not only is the skin reflex increased to a decided extent, so that tickling, simple contact of the clothing or even blowing upon the surface, will provoke variations of mobility of irregular and disorderly character, but there is a phase of excitement known as the “tendon reflex,” which plays an important part in all these cases.

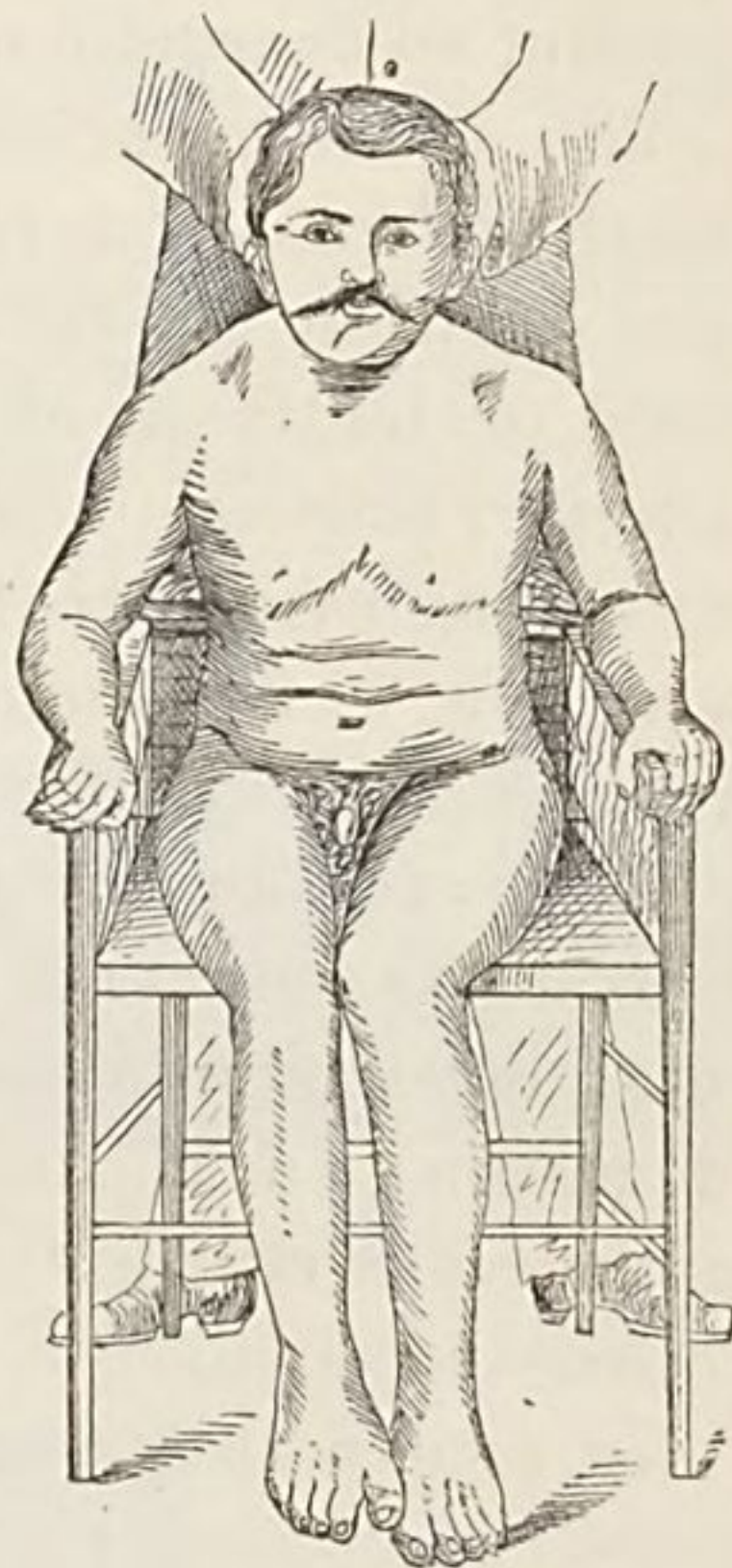
There are a number of manifestations of motor irritation which have been described independently; but I am of the opinion that they all resemble each other, and all depend on activity of the so-called “tendon-reflex” just described by Erb¹ and Westphal.²

If certain tendons be subjected to slight violence, there will be as a result an immediate contraction of the attached muscle. Different degrees of applied force produce varying manifestations of motility.

Let us consider first the ordinary and well-known tendon rapping experiment.

If the thigh of the patient be held so that the leg hangs pendulous, it will be found if the ligamentum patellæ be struck with the side of the hand, a pleximeter, the edge of a ruler, or

Fig. 2.



¹ Archiv für Psych. B. v., H. 3, p. 792, 1875.

² Ibid. p. 803.

in fact any other convenient object, that the foot will be thrown out by a sudden contraction of the quadriceps, with more or less violence. This same phenomenon will follow excitation in other parts, the particular muscle attached to the stimulated tendon causing an energetic movement of the limb.

The earliest experiments of Erb and Westphal were evidently based upon those detailed by Brown-Séquard in his consideration of Epilepsy some years before. The so-called Knie or Unterschenkel Phänomen and Füß Phänomen, were simply varieties of clonic movement which followed forcible stretching of different tendons when the knee and ankle-joints were bent in flexion, and are varieties of tendinous reflex. The simplest and usually most easily produced movements follow circumflexion of the foot.

From an inspection of a large number of cases, I am certain that the value of this test depends very much upon the degree of flexion; for if too little stretching of the tendo Achillis is made, the results will be as unsatisfactory as when the tendon is over-tensely drawn.

To evolve this clonic movement (*Dorsalklonus* of the Germans, *trepidation provoquée* of Charcot), the operation is to grasp the skin (but not too tightly) with the left hand while the palm of the right hand is brought in apposition with the plantar surface of the patient's foot which is passively flexed so that the toes are forced *slightly* upwards. The foot is kept in this position, and usually in a very short space of time, often immediately, there is manifested a clonic spasmodic movement of alternate flexion and extension.

Sometimes such motor disturbance continues after the hand is removed, the patient's foot being extended, the heel retracted by the muscles uniting in the tendo Achillis; and while raised several inches from the floor, it is agitated for some time—several seconds usually, but I have seen cases in which the trepidation lasted nearly half a minute.

This trepidation is extremely variable; and, like the movements following the tapping of the tendon, it presents different features in different cases and at various times. In some cases, it instantly follows the original stimulation, and increases in frequency, the intervals between the separate contractions decreasing, and the muscular movements increasing in violence.

In one patient at present under observation, the initial tap

causes at first an immediate but not very violent *kick*. This is followed by others which increase in the frequency of their appearance seemingly as if every muscular contraction aroused new collections of new force and promoted the escape of nervous discharge, until finally as the irritability of the cerebral apparatus becomes exhausted, the contractions grow weaker and ultimately cease.

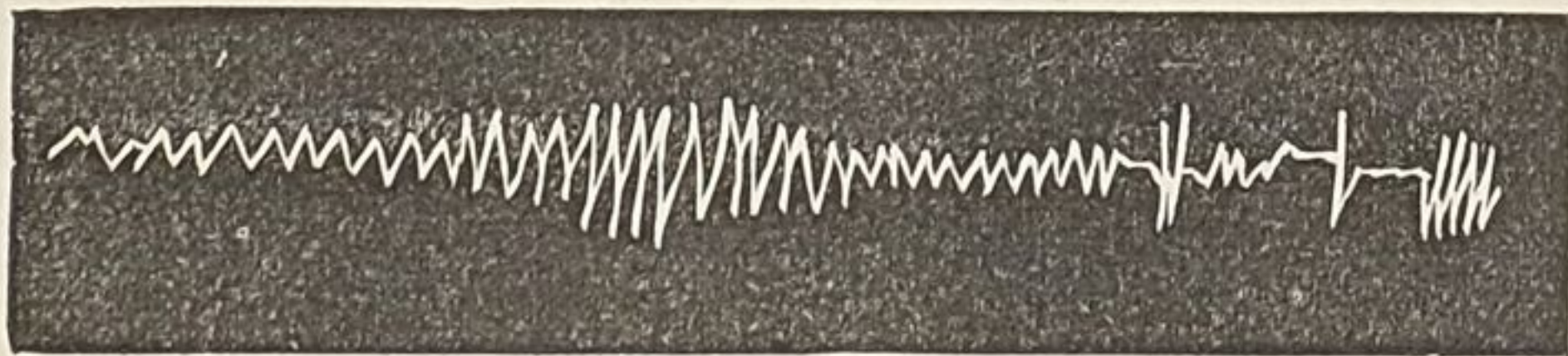
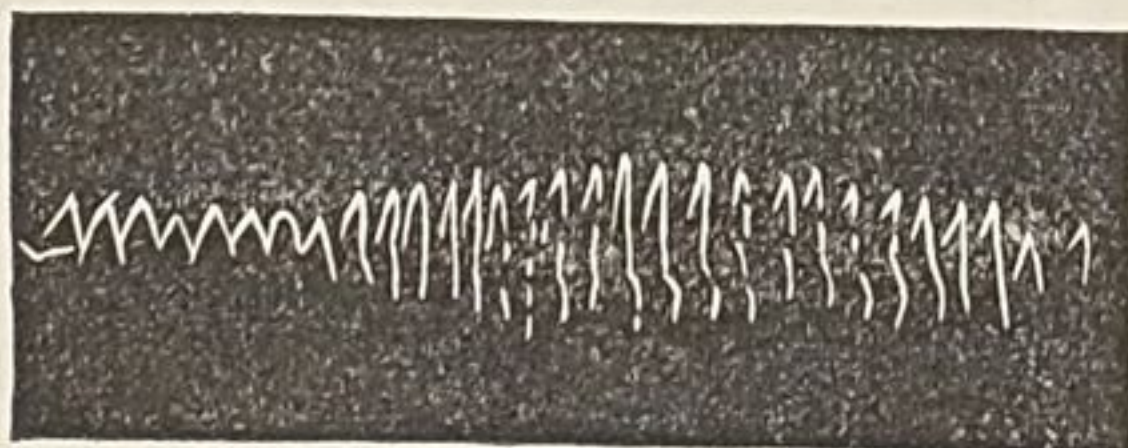
By an adaptation of the Maréy tambour, I have been enabled to secure a tracing by the graphic method, which very beautifully illustrates what I have just said. (See Figs. 3 and 4.)

Fig. 3.



Myographic tracing of separate tendinous reflexes. (Lig. patellæ.)

Fig. 4.



Myographic tracing of successive reflexes after initial blow.

In some cases the simple passage of the finger over the skin of the foot will give rise to this epileptoid tumor.

This form of skin excitation of the tendon-reflex, has been the subject of much discussion, and on the one hand we find Erb¹ expressing himself in direct disbelief, while on the other Joffroy² has repeatedly produced the trepidation by the application of such gentle excitants to the skin as the contact of a finger-tip, or a damp compress.

¹ Cyclopæd. of the Pract. of Med., vol. xiii. p. 110.

² Gazette Médicale de Paris, 1875, Nos. 33, 35.

Grasset¹ reminds us very forcibly that when the patient is under emotional excitement, or when he makes an effort to execute certain movements; or again, after the embarrassment at meeting a strange person, chronic spasms are sometimes spontaneously produced, and holds that Erb is too restricted in his views; and that therefore it does not follow that the tendons must actually be put upon the stretch, or otherwise actually excited to give rise to the phenomena just described.

The tendon-reflex, of course, is subject to various influences, and presents different characteristics at extreme stages of the diseases of which we speak. It may be excited in the lower extremities in the majority of cases, for the bulk of examples of primary disease of lateral column degeneration are seated in the middle and lower parts of the cord; but when there is an upward extension of the lesion either as a primary or secondary process, or when the lateral columns are the seat of disease subsequent to cerebral degeneration, the tendons of the upper extremities may be readily excited.

In the later stages of disease of this kind, it is usual to find a blunting of the tendon-reflex excitability which indicates an advance of the morbid process into the posterior columns.

In the latter part of the first and throughout the second stage of primary disease, for instance, it is possible to provoke the phenomena, which have been described by the slightest agencies.

The exhibition of reflex irritability seems to be materially modified by changes in temperature; and in the several cases I have carefully examined, it was always greatest when the patient was in a warm bed, or after he had been in a heated room.

So, too, position and muscular tension seem to play a part in the creation and greatly affect its intensity and duration.

A variety of clonic movement, called by the French "*trepidation spontanée*," takes place when no apparently affecting stimulation is used. The movements of a tremulous character which agitate the lower extremity of a healthy person who is fatigued after a long walk, or some such other effort, is but a simple illustration of the condition of affairs which exists in disease of the lateral columns of a more pronounced degree. A constrained position, or one in which the tendons are slightly stretched, is

¹ Maladies du Syst. N., Paris, 1861, p. 375.

highly favorable to the causation of a paroxysm of tremor, and where the central irritability is great, the mere contact of the clothing is oftentimes all that is required as a peripheral irritation.

The recumbent position and rest seem to modify the violence and frequency of these phenomena; for it is only in exceptional instances that they occur during sleep. As soon, however, as the feet come in contact with the ground, the retraction of the heel takes place, and every step in walking is connected with more or less spasmodic movements.

A form of reflex trouble which has received but little notice, is the abdominal reflex. This I have noticed in lateral disease, and I think it should be considered always as a pathognomonic sign of the affection.

When the finger is passed ever so slightly over the abdominal parietes there will be a peculiar, almost vermicular contraction of the underlying muscles. I have never seen this sign absent in spasmodic spinal paralysis. Its absence in hemiplegia of cerebral origin has been noticed by Rosenbach,¹ who suggested that the non-existence of contractility in the cremaster and certain muscles of the abdomen, was the rule in that form of paralysis. He tested the pressure of abdominal reflex in a number of cases of hemiplegia and found it absent, but the tendon-reflex increased.

This excitable condition of the abdominal muscles has probably something to do with the curious action of the bladder; and it is probable that the muscular fibres of this organ are also subject to reflex spasm which results in the forcible and spasmodic discharge of the urine which sometimes occurs.

In certain cases the action of the will is capable of modifying, if not stopping disorderly movements of a reflex nature; but in the great majority the reverse is the rule, and the attempted exercise of the volition is frequently enough to increase the movements.

In the normal state, it is possible for the individual to defeat the success of the tendon-rapping experiment, so that its value as a diagnostic sign of locomotor ataxia is apt to be of less moment than it is generally supposed to be; while in developed lateral sclerosis, it is seemingly beyond the control of the will.

In one case I have witnessed a phenomenon which is not un-

¹ Archives für Psychiatrie und Nkh., vi. 1876, p. 845.

common in connection with the transmission of peripheral painful impressions. I allude to *delayed conduction*.

In this case the tap was not immediately followed by contraction; *but from three to five seconds elapsed before any movement was to be observed.*

The tendons in which reflex movements are most readily produced are the following:—

TENDONS.

- | | |
|-----------------------------|---------------------------|
| 1. Ligamentum patellæ. | 8. Tend. of triceps hum. |
| 2. Tendo Achillis. | 9. “ biceps hum. |
| 3. Adductor tendons. | 10. “ flexors of fingers. |
| 4. Tend. of tibialis ant. | 11. “ extensors. |
| 5. “ tibialis post. | 12. “ deltoid. |
| 6. Semitendinosus mus. | 13. “ pectoralis major. |
| 7. Tend. of biceps femoris. | 14. “ supinator longus. |
| 15. Tend. of interossei. | |

Absence of Trophic Disorders.—In pure uncomplicated disease of the posterior part of the lateral columns, there should be no atrophy. In varieties beginning with disease of other parts, or injury, such a condition of affairs is possible but not commonly seen, and any loss of muscular substance is simply due to inaction of the limbs, and is of peripheral origin involving the entire limb or a part which is the seat of paresis. Bed-sores are not a feature of the paraplegia, at least not until the other parts of the cord become involved, but, in the early form of the secondary local affection they are sometimes seen, as was the case in two or three of Seguin's patients. In the latter stages of primary disease they do occur and have been occasionally observed.

In no case have I observed skin diseases, or skin malnutrition, arthropathies, or other indications of defective nutrition.

Vascular Changes.—In the confirmed and advanced examples of the disease, a mottled and bluish appearance of the extremities (such as is witnessed in pseudo-hypertrophic and infantile paralysis), is quite common. This is more (noticeable) when the patient's clothing is removed and the skin exposed to the air when the pink blush appearing at first gradually assumes a dusky hue.

Disturbances of Sensation.—Although all authorities deny the existence of any form of sensory alteration, they nevertheless prove by their published cases that in the earliest and sometimes in the later stages of disease of this part of the spinal cord, various sensory phenomena are presented. For instance,

in seven out of twelve cases of primary disease of the lateral columns, in three were pains, anæsthesia, or light forms of hyperæsthesia. "Tingling," "burning" sensations, dragging pain, "pricking" or "numbness" are spoken of, and probably arise from some irritation of the gray matter.

It may be stated positively that the absence of anything like sensory disturbances such as are found in other spinal diseases, is the rule; but it cannot be denied that an occasional or early diminution or more commonly elevation of the cutaneous sensation is a feature of affections of this kind.

In the secondary disorders where perhaps a congestion of the posterior columns is the primary morbid process, or where pressure is made by some growth, or by a diseased vertebræ, or, as is sometimes the case, by the products of inflammation in meningitis, there must be more or less disturbances of sensation. In special varieties this is decided, and when associated with hysteria, it is not unreasonable to expect to find anæsthesia; but unlike the impaired sensation in true spinal disease, it is irregularly disturbed, and often associated with hyperæsthesia in other parts.

In one of the cases reported by Seguin (which has been previously alluded to), there was anæsthesia which was probably the result of injury of nerve tracts other than the lateral columns, but as in other cases the *symptoms of lateral disturbances predominated*.

Tactile sensibility seems to be in no way affected; and appreciation of heat and cold are usually normal, except in the later stages, when subjective cold is complained of.

Functions of the Bladder and Sphincter Ani.—In no case are there any indications of paresis of the bladder or rectum. Constipation is not usual; and if there is any bladder trouble it is one of a forcible nature, and accompanied by spasmodic ejection of the urine.

Ataxia, etc.—The patient is quite able to stand with his eyes closed, before his loss of power renders him helpless—and he can coördinate properly. The only exception to this rule is where the disease has involved the posterior columns, as in the complicated cases mentioned by Erb.

I.

CONGENITAL IMPERFECT DEVELOPMENT OF, DEGENERATION OF THE LATERAL COLUMNS OF THE SPINAL CORD. INFANTILE FORM (PROBABLY THE "SPASTICHEN SPINALLÄHMUNG BEI KLEINEN KINDERN" OF ERB).

The subject of spasmodic spinal paralysis of infancy has received but passing notice and a fragmentary contribution of Erb¹ is the only description to be found of the disease which is the analogue of adult spastic paralysis of the primary form. Four cases were presented by this observer, two of which were described in his second article² in Virchow's Archives; and two others are detailed in the communication before referred to.³

I have seen several in this country which are clearly marked examples of spastic paraplegia. Several of these cases have also been observed by other American physicians, but not recognized and described, although in more than one case the disease has been regarded as the result of preputial irritation from phimosis.

The paresis is usually not recognized until nearly a year or so after birth, when the child should walk but does not do so; and in such cases the ailment, as Erb has pointed out, has too often been mistaken for infantile palsy, or some such common disease of early infancy.

If this error is not made, ante-natal cerebral hemorrhage, or spinal traumatism, is generally supposed to account for the paralysis. One-sided brain atrophy, such as has been alluded to by Taylor,⁴ produces a hemiplegic condition with contractures, exalted tendon-reflex, etc., but cerebral symptoms of greater or less importance are added thereto.

Finally, it has been the fashion of late to ascribe all the trouble to an irritated and phimosed prepuce. Circumcision has even

¹ Op. cit.

² Virchow's Archiv, B. 70, p. 293.

³ Since this essay was submitted some excellent cases have been presented by Dr. C. K. Mills, of Philadelphia, and others.

⁴ Guy's Hospital Reports, 1878.

been tried in many instances ; but the rigidity and paresis have remained the same, for in all of these cases the trouble was far beyond the surgeon's knife.

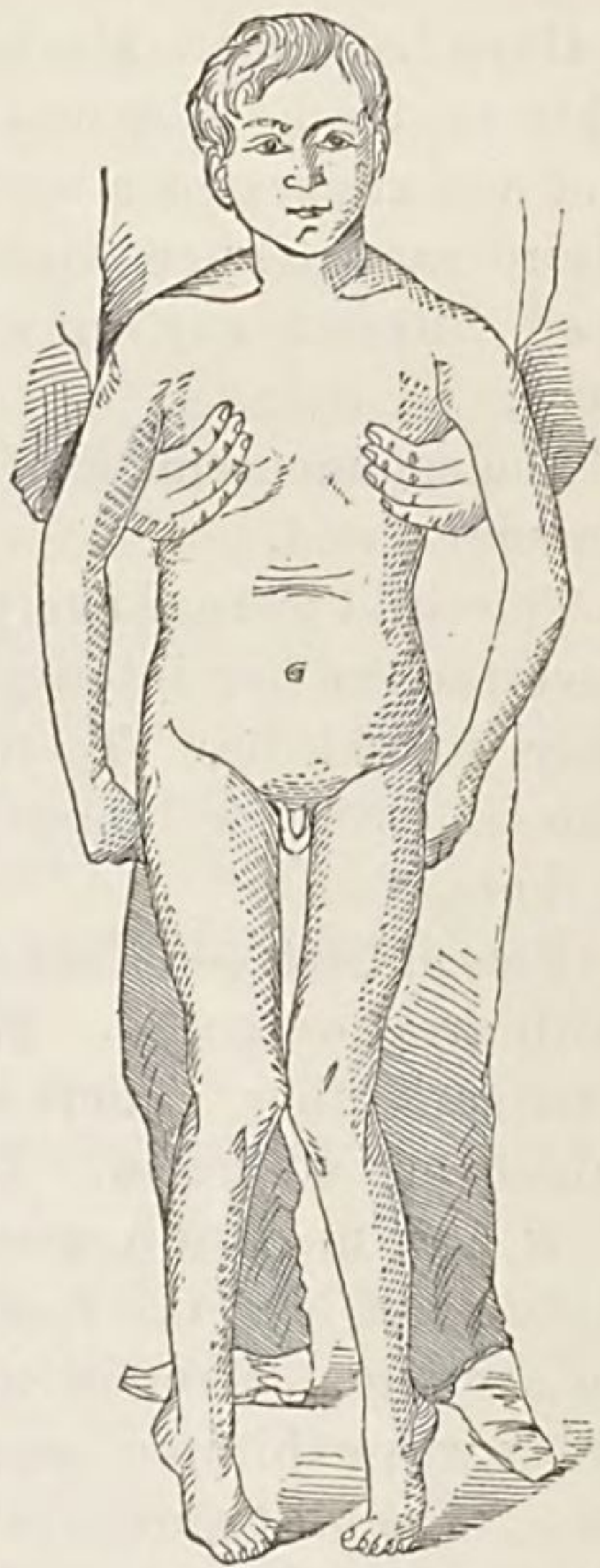
In this form of disease, or congenital partial absence of the lateral columns, the contractures, according to Erb, make their appearance at a very early age. In one of the patients, whose history I shall presently narrate, the limbs are as rigid at the age of seven, as they would be in the advanced stage of the disease in an adult ; and in such a condition, I understand, they have been since the third year.

This early development of contractures is ascribed by Erb to the imperfect voluntary power which belongs to childhood, which prevents the little patient from exercising or resisting the advance of the deformity (Fig. 5).

So, also, subjective coldness is noticed, and the cutaneous circulation is sluggish, so that the limb has a mottled appearance. The ability to speak seems to be impaired, not from a condition of *mental* weakness, however, for the mind of many of these children is quite active ; but there seems to be both a local awkwardness, and a disinclination to talk.

Unless the patient is held upright, he is quite unable to walk alone, for there is crossing of the legs, and adduction of the thighs. If a determined effort is made to walk, he being supported meanwhile, his feet will be drawn into the position of talipes, of which I have so often spoken, and his toes will catch the ground at every step. The disposition is for the feet to be drawn across each other, so that, in an extended position, one foot covers its fellow, and so they remain. When laid upon the bed, the legs and thighs are sometimes drawn up, and agitated by clonic movements. In severe cases the loss of power

Fig. 5.



is so great that (as in adult cases), the patient cannot lift his feet or raise his legs.

No sensory disturbances are complained of; and in but one of the cases was there any symptoms of this kind, and that a slight hyperæsthesia. Skin and tendon reflexes are increased. Bladder and sphincter ani, normal. Cerebral symptoms, *nil*.

A curious fact appears to be established, and this is that in three of the cases, which I shall narrate in detail, the children were prematurely born; and, I think, great importance of a pathological kind must be attached to such a state of affairs.

CASE I. (Erb¹). Marie B., four years of age. Seen by Erb, July 26, 1876. She was a "seventh month child," was strong, and had always been well, with the exception of slight gastric disorders, until her third year, when her present trouble developed without any convulsive seizures, fever, or ocular symptoms.

The commencement of her illness was entirely unknown and unappreciated.

The child learned everything easily except the act of walking; nevertheless her intelligence and ability to speak were what they should be. Teething occurred without complications. She is a rosy, well-nourished child, and chats glibly with her parents.

Present State.—When supported, it is possible for her to walk with great difficulty. She extends her feet, which are crossed over each other. There is decided paresis of the legs and thighs, which are adducted. The only movements possible are of a slow and uncertain nature. Extensive muscular rigidity and stiffness of legs, the feet being in a position of talipes equinus, no atrophy. Electric contractility fair; very marked tendon-reflex was exhibited, especially in the adductors, talipes equinus, etc. Sensibility appears to be normal; and movements follow tickling of the soles. There are no bladder or bowel disturbances of functions. The arms are in no way affected, and the head and eyes are not involved in the disease. No strabismus; no impairment of intellect; no pain caused when the child is lifted. Cause entirely unknown. The parents were quite healthy, and had brought into the world five other children who were vigorous although all born before full term.

¹ Memorabilia, loc. cit.

CASE II. (Erb¹). Marie Gordon, two years old. Applied to Erb, July 18, 1876. When three weeks old, the child had a little rheumatic (*gichter*) fever; but with this exception had always been well. When she was one year old, feebleness of the legs was first noticed, although she had never manifested much muscular force. It was found that she could not stand, that walking was impossible; otherwise the bodily development and mental condition were perfectly normal, and she spoke and displayed unusual brightness.

Present State.—Marked paresis of legs, with contraction of extensors and rigid adductors. Tendon-reflex increased, surface sensibility normal, no atrophy, electrical reaction good. Functions of bowels and bladder quite regular; arms not involved; vertebral column unaffected; and it is impossible to find a painful point at any place. Fair intelligence. There has been within the past few weeks slight squint.

Cause entirely unknown; and it is impossible to trace any hereditary predisposition.

CASE III. (Erb²). George N., four-and-a-half years old; born at the seventh month of utero-gestation, but nevertheless fairly developed. During the first year it was once noticed that there was a respiratory spasm. Intelligence, memory, and speech quite perfect. Dentition and shape of teeth satisfactory; but the boy could not be taught to walk.

There was no hereditary taint, or any other known cause.

Present State.—Boy well developed and nourished; is absolutely unable to stand without assistance; cannot walk unless supported. When held up, he is with difficulty able to make certain clumsy attempts at progression, putting his feet forward but crossing them, while the thighs are adducted. A careful examination shows paresis of the legs with great rigidity but no atrophy. Skin sensibility appears normal. The skin-reflexes (plantar, cremastic, abdominal), are quite active. Tendon-reflex increased, and dorsal clonus marked in both feet. Action of the bowels quite normal. Upper extremities are entirely unaffected; no brain trouble; cranial nerves generally unaffected. There is, however, a slight strabismus; no vertebral deformity.

¹ Op. cit.

² Virchow's Archiv, Bd. 70, 1877, p. 241.

CASE IV.¹ Ludwig S., three-and-a-half years of age; born perfectly sound and has never been ill. He, however, never walked, and only began to speak in his third year, and even now does so quite indistinctly. No hereditary right to the disease; and no ascertainable cause.

Present State.—The boy is well nourished, vigorous, and of intelligent appearance, but entirely unable to walk on account of want of power; tension and contracture in both legs, the thighs being firmly locked together (*contracture of the adductors*), knees slightly bent (*contracture of the hamstrings*); strong equinus varus (*contractures of the calf-muscles*). When supported, the child is able to walk a little, and goes on tip-toe, while the feet cross each other, and he trembles. Tension of muscles pronounced and visible, feet quite cold; sensibility of skin and skin-reflex quite normal. Tendon reflex considerably increased in the adductors, and biceps-femoris, but no dorsal clonus of the feet. Perhaps some weakness of the bladder, as he is obliged to urinate frequently. Vertebral column and upper extremities unaffected. No trace of rachitis; formation of teeth fair, eyes, ears, tongue, etc., quite normal. The boy behaved quite sensibly during the examination, but his speech was very incomplete; and he was able to pronounce only a few words distinctly.

The parents never noticed any convulsions or strabismus; sleep, appetite, and digestion good.

Of late he has been quite worse.

CASE V. (Personal.) Thomas Lowry, aged five years. It is impossible to get any satisfactory account of the child's antecedents, as he is the occupant of a public institution. It is ascertained, however, that since birth he has not walked.

Present State.—He is fairly nourished, of ordinary intelligence, is in no way idiotic, although he is disinclined to speak, and uses but few words. His head is of normal shape, with perfectly closed fontanelles; gums and teeth in good condition, and there is no rachitic trouble. His vertebral column is in no way affected, and there are no painful points or projections; no atrophy of any part of the body, nor is there any alteration of cutaneous sensibility. He is able to appreciate very readily changes of temperature, painful impressions and tactile contact.

¹ Loc. cit.

When his eyes were closed I passed my finger lightly over the surface of one leg and asked him to tell me what I had done. With his own finger he exactly imitated the action I had just performed.

There are no rectal or vesical troubles, and he has always been able to control these organs. When held by his shoulder and arms he is able to progress with difficulty; his feet being extended quite rigidly; and his legs are the seat of spastic contractures; the adductors being tense, so that the knees are approximated. There is the same tendency for the feet to cross each other, and they frequently do so. He cannot stand alone and cannot raise his feet when sitting or lying, and when in his chair his toes touch the ground, the heels being retracted. Reflex action of the skin of the plantar surface and abdominal reflex marked. Tendon-reflex very violent, and clonus of the feet quite susceptible to slight influences; tapping, flexion, or jarring produces it; great rigidity of both knees when passive flexion is attempted; slight rigidity of right wrist; tendon-reflex in triceps tendons perceptible. No cranial nerve trouble, strabismus or other ocular symptoms, no appearance of facial paralysis. Feet rather cold; toes are flexed.

CASE VI. (Personal.) Mary E. Gillen, aged thirteen years. No nervous heritage. Child is a bright intelligent girl, who speaks and takes an interest in everything; poorly nourished. No account of premature birth.

Present State.—Patient is unable to stand alone, and states that she never could walk. It is found that she cannot extend her leg, but can her thighs; upper extremities quite unaffected. There is great spastic rigidity of the lower extremities, and a tendency to flexion; and when in this position, it is impossible by any volitional effort for her to straighten them. Tendon-reflex of tendon ligamentum patellæ excessively violent on right side, and almost as much so on the left. Dorsal clonus very well pronounced and greatly increased by nervous mental excitement, incident to the examination. The foot continues to be agitated some time after the original irritation. Abdominal reflex and plantar reflex very much exaggerated.

Special senses unaffected; no cutaneous disturbance or slight "hyperæsthesia;" "spasticher-gang" attended with some pain as the weight of the body comes upon the flexed toes. Intelli-

gence invariably good; vesical and rectal complications absent; no vertebral disease whatever; no convulsions, ocular troubles, or other cerebral symptoms.

CASE VII. (Personal.) This case was described as a case of reflex spasm. I am now disposed to believe (in the light of recent discoveries) that it is one of genuine spasmodic paralysis.¹

Rosa Alexander, seven years of age; born at the seventh month of utero-gestation; was asphyxiated at birth, and it was ten minutes before she could be restored.

One year after birth she contracted scarlet fever, but without complications. Immediately after birth it was noticed that there was want of power in the lower extremities—she could not move her legs at all. This continued and seemingly increased so that she is utterly helpless and cannot stand.

Present State.—The legs seem to be of good size, and there is no trace of atrophy whatever; measurement shows no disproportion between the limbs of either side. The temperature of the paralyzed limb is not lower than it should be, except perhaps that the feet are not so warm as the other parts of the body. There is no abnormality of sensation. When held upright, her legs become quite rigid, and there is crossing of the feet by each other. This is always the case when she is placed in the erect posture. At night she occasionally lies with flexed lower extremities, but this was more constant two or three years ago.

In the attempt to walk a double talipes results; and for a short distance she is able to move forward when held. The feet and knee phenomena are easily produced; and although the knee-joint becomes rigid when the hand is placed beneath for the support of the lower end of the thigh, the leg is thrown out quite forcibly when the ligamentum patellæ is tapped ever so lightly. There is neither vesical nor rectal trouble, vertebral deformity, nor back pain. She is in no way idiotic; but seems disinclined to speak. No cerebral or ocular symptoms; fundus oculi normal; vision unaffected; tongue protrudes in a straight line; conformation of head regular. There is no history of intestinal worms or other trouble.

It was my opinion in the beginning that an irritable condi-

¹ Nervous Diseases, etc. Phila. 1878, p. 482.

tion of the clitoris had had something to do with the causation; but the absence of any present abnormality shows that I was in error.

An inspection of the foregoing seven cases must make us cognizant of their very striking general resemblance to each other. They all present a train of symptoms purely spinal in character, and indicative of disturbance or disease of the lateral columns. In every case, the actual loss of power probably dated from birth; although in two or three of Erb's cases, it was not noticed until the children were expected to walk; they were then found to be unable to do so. In every case but one the lower extremities were alone affected. In no case were there cerebral symptoms, and in none was there any paralysis of the cranial nerves, although two presented squint, which was probably a form of peripheral trouble so common in childhood. In six speech was affected to a greater or less degree. There was no atrophy in any case; no vertebral disease nor rachitis.

Of these seven cases, four were girls and three boys; and their ages were respectively 2, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, 13, and 7. In none of these cases could nervous predisposition be shown.

In no way can this form of disease be mistaken for any of the ordinary paralytic diseases of infancy. If such a mistake were possible, we would, perhaps, say that "infantile paralysis" might be the only one forming the subject of doubt; but as atrophy is the chief distinguishing feature of that affection, it might safely be left out of the question. So, too, in that disease there is usually a convulsive, febrile, or other "onset," which does not belong to either infantile or adult *spasmodic* spinal paralysis. Electrical reaction, which is almost, if not quite, lost in infantile paralysis, is preserved in all of the examples of disease of the lateral columns of the spinal cord.

Seeligmuller¹ presented some cases which are of exceeding interest, and resemble very closely those I have just detailed. His observations were made upon seven children in one family! Several of the cases presented advanced symptoms of a disease, which, by some authors, has been mistaken for spasmodic spinal paralysis. They were all strong at birth, but when nine months old began to lose power, which fact was shown in various ways,

¹ Deutsche Medicinische Wochenschrift, Apl. 22 and 29, 1876.

and especially later on when they began to walk. All four extremities were affected; and there was *atrophy* and loss of faradic reaction.

These patients were, doubtless, the victims of disease of the antero-lateral columns of the spinal cord, and the lesion was rather more posteriorly situated than in the majority of Charcot's cases of amyotrophic lateral spinal sclerosis, which their affection probably was.

In several cerebral diseases, some of which are of very early origin, there are occasionally manifested hemiplegic or paraplegic symptoms, which may be mistaken for one-sided varieties of the disease under discussion. Taylor¹ reports a number of cases of unilateral atrophy of the brain, some of which are symptomaticized by paresis, exaggerated tendon-reflex, etc., but the cerebral symptoms, as I have before shown, are too well marked.

In an interesting article, by Ludwig Meyer,² cases of deformity connected with idiocy are spoken of. The deformity of the lower extremities closely resembled the appearance witnessed in infantile spasmodic paralysis, and there was imperfect speech. The hands were badly developed, and the heads and bodies were malformed, so that an ape-like deformity resulted.

Faradic electro-muscular contractility was not found to be especially impaired in these cases, although it may occasionally be found to be lowered.

As I have before stated, it is quite probable that this disease is often supposed to be due to some exciting cause; and among the more common, the presence of intestinal worms, or genital irritation may be mentioned. The use of anthelmintics and the surgeon's knife are, however, useless; and while it is a good sanitary procedure, circumcision is of no avail.

II.

FUNCTIONAL NEUROSES OF THE LATERAL COLUMNS.

The recently reported case seen by Kussmaul³ is an example of this kind, for certainly the favorable results obtained by him were highly suggestive of this conclusion. Berger⁴ has also

¹ Guy's Hospital Reports, 1878.

² Archiv für Psych. und Nerven krankh. vi. p. 1, 1874.

³ Berliner Klin. Wochenschrift, Sept. 23, 1877.

Abst. in Centralblatt, July 13, 1878.

seen a case; and I have no doubt but that many of the cases of spasmodic troubles of the lower extremities, known heretofore as "functional spasm," are but varieties of an ischæmia of the lateral columns.

In Handfield Jones's work¹ I find reference to a case reported by Bamberger, which is as follows:—

The patient was a youth nineteen years of age, who, during convalescence from pneumonia, began to suffer from a spasmodic affection of the lower extremities. "As soon as he touched the ground with his feet, all the muscles of the lower extremities fell into a state of tetanic rigidity, interrupted by the most violent sudden contractions, which threw the patient upwards; and during their rapid recurrence increased in intensity, so that the patient had to be supported. At the same time, the face was flushed and distorted, the pulse accelerated and extremely feeble. The moment that the patient sat or laid down all the movements ceased. If, while lying in bed, the soles of his feet were pressed, the same phenomena appeared, but with much less intensity."

He was cured by sedatives and cold affusions.

Kussmaul's case was one of this kind, for complete recovery took place in a remarkably short time—scarcely a year from the period of attack.

The rapid development of symptoms in this case is remarkably suggestive of its functional character, and the mental disorder is worthy of attention as an unusual complication.²

"E. P., aged twenty-seven, clerk; had a good family history, and had enjoyed good health with the exception of a short, indefinite period at seven years of age. No traces of syphilitic infection could be discovered. Slight kypho-scoliosis was present, which, the patient said, dated from birth. Two days before admission he attempted suicide by jumping into the river. After being rescued, he walked several miles home in his wet clothes, exposed to a high wind, and went to bed. Next day he complained of pains in his abdomen, and gastric troubles. On admission, on May 13th, tongue was coated, and the abdomen somewhat hard and full. There were no other objective symptoms. He had no appetite; there was constipation; temperature 109°, pulse 82, respiration 14. Castor oil was ordered

¹ Schmidt's *Jahrsbericht*, vol. cii, pp. 23-24, quoted by H. Jones on *Functional Nervous Disorders*, p. 398.

² Abst. in *London Medical Record*, Dec. 15, 1878.

that night. No abdominal pain, but a feeling of pressure on the chest. There were no physical signs, no fever.

"17th. He had pains in the region of the bladder, and dragging pains in the testicles. His appetite was good, the alvine excretions were natural, he looked pale and anxious and refused to get up.

"18th. The patient was small and anæmic with weak muscular development, but moderately fat. He complained of a peculiar stiffness in the legs which he first noticed the previous evening. He had no pain and slept well. No disturbances of circulation, respiration, or digestion were present. On being lifted out of bed he was unable to walk; he could hardly move one leg before the other, and could not flex either knee or ankle. Both legs were stiffly extended by a spastic contraction of all the muscles, slight tremor was also observable in them. The spasms became more intense while the patient stood, and he was thrown more and more forward on his toes. When supported on both sides and taken along the wards, he either let both legs drag stiffly after him, or attempted by means of the pelvic muscles to swing them around alternately. On being replaced in bed the muscles of both lower extremities were seen to be both strongly contracted and in a state of constant tremor. The latter, however, gradually passed off when the patient was left quiet and became warm in bed. All movements could be performed, but only very slowly. Passive movement of the limbs met with moderate resistance. After about half an hour the spasm also became less severe, movement was easier, but still evident. No pain was caused by pressure on the spine. There was no disturbance of sensation. Neither trophic nor vaso-motor symptoms could be discovered. The sphincters were unaffected; the intellect was clear; there was no vertigo nor inequality of the pupils; there was neither albumen nor sugar in the urine.

"23d. The patient stated that when he was warm in bed his legs neither trembled nor were stiff, that he could lift them only a very slight distance; he could not cross one over the other. The attacks of rigidity and tremor occurred two or three times daily; sometimes spontaneously, and sometimes in consequence of external causes. During a strong attack the patient would perspire freely, and afterwards feel quite exhausted. Strong pressure upon the crural nerve during the attack caused the muscular spasm to cease in the leg of the same side, but to become more powerful in the other. By dint of great exertion

the patient was able very slowly to flex either of his legs during the period of spasm; as soon however as the leg and thigh were inclined to one another at an angle of 45° , the muscular resistance to the movement suddenly ceased and the heel was brought with considerable force against the nates. The whole phenomenon very much resembled the sudden closure of a pen-knife after the resistance of the back spring had been overcome. The limb was now spasmodically flexed in the position of extreme flexion. The spasm could be at once relaxed by exerting pressure upon the crural nerve. If this were not done, and the patient was directed to extend the leg, he was able to do so slowly with great exertion until it had passed the right angle, where it was suddenly and violently brought into the position of extension.

"The tendon-reflexes were greatly increased, sensation was diminished; electric contractility showed no qualitative abnormality, but was somewhat diminished in degree."

Until July there was progress in the severity of the symptoms; lower limbs paralyzed; emotional disturbances; suicidal tendencies. He then began to recover and was able to walk with two sticks; and there was transitory weakness and tremor of the arms; some affection of speech and some burning pain in the legs. He had several attacks, one in the winter of 1878 when he was confined to the bed for some time during which his legs began to atrophy (from disuse only). During March, April, and May, there were other attacks, but he steadily improved, and towards the end of May was able to walk without trouble.

On the 24th of June he was discharged, cured. At this time there was only a slightly increased patellar reflex as a lasting symptom.

In this case a rectal injection of from grs. xx to grs. xxx of chloral did much to subdue the spasms. He also took chloride of gold and sodium in doses of gr. $\frac{1}{8}$ ter in die.

In this case the occurrence of paroxysmal attacks of cramp and psychical symptoms gives it a different character from those of organic disease in which there is progressive decline and no periods of freedom from cramp or paresis. The mental symptoms were probably not directly connected with the disease, at least they have but little relation to the existence of spasm or other symptoms of lateral trouble, for he had an attack of delirium with suicidal tendencies a few days after his discharge.

III.

HYSTERICAL SPASMODIC SPINAL PARALYSIS.

The celebrated case of hysteria reported by Charcot, in which the four extremities were contracted, is one which illustrates a form of disease of the lateral columns occurring as an outgrowth of the neurosis which is so commonly thought to be a purely functional affection.

This, and other cases, are so well marked, however, and present such unmistakable symptoms of both diseases, that I think a hysterical variety of spasmodic spinal paralysis may be recognized.

In all of the cases to which I shall refer, it is probable that the primary disease was purely peripheral, and as a central degeneration has been known to occur after section of important nerve trunks, there is no reason why we should not, with perfect reason, recognize the same pathological origin in cases where long existing hysterical paralysis has been connected with a more than ordinary inactivity and disease of a membrane.¹

Charcot, in his early fasciculus (1872-73), goes quite extensively into the question, and describes the "tremulation convulsive," and other symptoms. He says: "*Quelle condition est donc survenue et a entretenu ainsi l'existence de cette paraplégie avec rigidité des membres. Evidemment dans les cas recents de contracture hystérique, la modification organique, quelle soit, quelque siège qu'elle occupe, qui produit la rigidité permanente, est très legere, très fugace, puisque les symptomes qui lui correspondent peuvent disparaitre tout à coup sans transition . . . il s'est produit, à une certaine époque, une lésion sclereuse des cordons lateraux, lésion que la necroscopie permettrait actuellement de reconnaitre.*"

Briquet has seen cases of paraplegia complicated with contractures, and mentions three examples. In these cases there was pain and rigidity, especially when passive movements were attempted. One of his cases afterwards fell into Charcot's hands, and is that of which we have spoken.

The development of symptoms indicative of lateral column disease is rarely an early feature, and in the reported cases there was a primary hysterical paralysis, which had lasted for some

¹ Briquet: *Traité Cliniq. et Therap. de l'Hyst.*, Paris, 1859.

years, when the first indication of the degeneration of the lateral columns was an increase in all the reflexes, and an increase of the rigidity of the contracted limbs.

In more than one of Richter's¹ cases, there was a decided hysterical element, but this was not exhibited before the more important special symptoms had shown themselves.

The case which I shall take for illustration will be that of Miss C., a young lady, now twenty-two years of age, who has been ill for three years. Her hysteria has extended over a much longer period, but her present decided symptoms are to be traced back only to 1875. Her mother and father are both alive, and she has a brother and sister who are perfectly healthy. She has not suffered from any serious illness during her life other than the present trouble.

At the commencement of menstruation, she became very irritable, and quite nervous; had fainting attacks, and always dysmenorrhœa with a very slight discharge. She has had hysterical derangements of various kinds, but most of all hysterical vomiting, so that she could not retain more than a few ounces of food each day, and sometimes not even this.

About three years ago she became suddenly paraplegic, and suffered from extreme headache, left ovarian neuralgia, and took to her sofa, which she has never left, except when lifted and carried.

I saw her, for the first time, nearly one year ago. She was then suffering from an attack of hysterical vomiting, and was greatly emaciated; and complained of ovarian dysæsthesia.

By moral treatment and by blistering the skin over the left ovary, which was extremely tender, I was enabled to put a stop to much of the vomiting; so that, instead of eating but a fragment of cracker and a spoonful of preserves, she was able finally to eat two or three large slices of bread and butter; and an ounce of extract of beef in solid form during the day.

An examination, conducted by a gynecologist, revealed the fact that she was the possessor of a retroverted uterus, and a dislocated left ovary; and it was believed to be almost useless to attempt any local treatment, at least at that time.

Her legs were usually in a state of obstinate extension, and the feet were pointed sharply, as in the picture presented by

¹ Deutsches Archiv für Klin. Med., 1876, p. 365.

Charcot. Sensation was preserved and somewhat heightened. She was utterly unable to make any movements with the lower extremities, and, as a result of the continued inaction, they were thin, and the muscles very flabby. There was spinal tenderness over the seventh cervical spinous process. Her bladder and rectum seemed to be in good functional condition, with the exception of occasional urinary retention; but this corresponded to the catamenial period. Her organs of special sense were in a normal condition; but she could not read without a resulting headache. She was always disturbed by slight noises, and suffered from insomnia.

About six months ago I first noticed the exaggerated tendon-reflex; and when attempting to make passive flexion of the foot, produced a violent series of clonic spasms. These could be produced at will in both legs. The tendon-reflexes were marked not only in the upper but lower extremities; and a slight blow upon the flexor tendons at the wrist, would immediately give rise to a series of rapid movements of the whole limb. Her legs became quite rigid when a voluntary movement was attempted. Her feet would then be drawn over each other and the toes flexed.

This was more marked when she was lifted from the sofa and supported by the arms. Passive flexion of the knees would immediately give rise to a spastic condition of rigidity connected with a certain amount of pain. She would occasionally have periods of trembling, one or both legs being convulsed.

This condition of reflex excitement seemed greater in the left leg than in the right; and it was always more active during or just after menstruation. There was no special atrophy, nothing but wasting from disease, and her legs became more hard and plump after a month of massage. Her feet and legs were always cold, which was not only a subjective but an objective sensation.

In addition to these symptoms, there are various others which are not purely dysæsthesia. She has headache of a very severe vertical form, unilateral sweating, great dryness of the mouth, irritability of the stomach, and spinal tenderness. She has remained in this condition since, her symptoms of lateral column disturbance having greatly increased in violence. There has been no achromatopsia.

In this case the involvement of the lateral columns has been

very much like that which occurs, probably, in the more perfectly described primary trouble—the “spasmodic spinal paralysis.”

In Charcot's¹ case there was an early history of convulsions and of hemiplegic trouble—both, however, hysterical.

This patient, like all the others so far reported, was a woman, and her history is briefly the following:—

At fourteen years of age she had attacks of early convulsions coincident with commencement of menstruation, and later on they became less frequent, and were supplanted by a loss of power—the paralysis affecting both limbs of the left side.

At the age of thirty-four contractures supervened, and later paralysis, and contractures of the right side of the body followed. The patient remained in an almost immobile position for two years. A spontaneous subsidence next occurred; and she was able to attend to her household duties.

In 1855 a violent attack brought back the paralysis and contractures of all four extremities and the trunk. She remained in this condition until 1864, when she died of an intercurrent affection.

There were no head symptoms at any time.

An autopsy revealed extensive primary degeneration of the lateral columns which extended throughout the whole extent of these columns on both sides of the body.

Another case presenting paraplegia with contractures, is reported by Charcot:² The patient, a woman, was fifty-five years of age, and had had an attack of hysterical paraplegia some eighteen years before. “She had improved somewhat after the seizure, but for the past sixteen years there has been true rigidity of the muscles of the lower extremities, with predominance of the action of their flexors and adductors.” The feet were in the position of talipes equino-varus, which did not disappear when she was placed under the influence of chloroform. A muscular atrophy is spoken of which was not the direct result of this lesion.

In this case, as well as others of the paraplegic form, epileptic tremulation is alluded to, which was undoubtedly the same that is so often seen, and which is now more perfectly recognized as an invariable symptom of disease of the lateral columns.

¹ Gazette Heb., No. 7, 1865.

² Leçons sur les Maladies du Syst. N. 1872-73, p. 315.

Two of Richter's four cases were women; and hysteria played a prominent part in their histories.

In a very able thesis written by Alexis Hospital,¹ the pathology of hysteria is condensed quite fully, and much stress is laid upon the question of organic origin in certain cases, and alteration is found with the appearance of paralytic and other akinesic symptoms after convulsions; and he is of the opinion that the central trouble (degeneration of the lateral columns) is secondary; which agrees with the observations of Charcot and others.

We may assume, then, from our inspection of cases and symptoms, that hysterical spasmodic spinal paralysis is an affection which may be said to have its analogue in hystero-epilepsy; that there is always primary hysteria with paraplegic trouble, perhaps convulsions or disturbances of sensation of a vague character.

The hysterical paraplegia, if it be of long duration, eventually induces a degeneration of the lateral columns; and with this there is epileptic tremor, increased tendon-reflex, and contracture, and, in no case, is there spinal muscular atrophy.

IV.

PRIMARY DEGENERATION OF THE LATERAL COLUMNS.

(*Tabes dorsalis spasmodique*, Spasmodic spinal paralysis,
Lateral spinal paralysis.)

The disease which by Charcot has been supposed to be essentially a sclerosis of the lateral columns of the spinal cord, though in such a conclusion he has not been supported by Erb, has been called by the former "*tabes dorsalis spasmodique*," and by Erb "*spasmodic spinal paralysis*."

With the exception of the few infantile cases already detailed, which I do not believe to be identical with those in which the disease begins later in life, as far as pathology is concerned, the reported cases have all been among adults. In all the cases so far observed, the beginning of the disease has been singularly slow and insidious. There has been no febrile stage, and absolutely none of the early and sudden symptoms which attend the

¹ Thèse de Montpellier, 1875.

development of many of the spinal paralytic diseases; but, on the contrary, the development of symptoms has been very gradual.

In most of the cases so far brought forward, there have been initial symptoms of a sensory character, although few of them have been more than irregular and fugitive. Dragging pains in the hips, and down the back of the thighs, pain in the back, and sometimes hyperæsthesia of no very lasting or severe kind enter the list.

In Erb's¹ cases (sixteen in number), seven presented sensory symptoms in the first stage. In six the pain was, without doubt, due to spinal irritation; and in the other cases, there was a doubt in favor of articular rheumatism. There were various transitory and ill-defined pains, formications in the fingers and soles, and subjective cold. In Schulz's² paper, other cases with such initial symptoms are mentioned.

Charcot,³ however, does not believe in the existence of pains during the first stage, and a few other authors agree with him; but in the German and American examples of this disease, so far reported, there is ample reason to believe in their existence in about one-half of the number of cases.

These sensory troubles usually last for a few months, and may be coincident with the appearance of muscular weakness, such as has been described under another head.

The gradual appearance of the early symptoms is shown in the case of Mr. A., who consulted me a few weeks ago. He is a young man, twenty-nine years old, who had been, until about three months ago, living upon his farm, and actively employed in out-door work.

About June last he first noticed that he became easily fatigued after very little exertion; and when he walked home, his knees became stiff, and there was a disagreeable dragging sensation about the loins, and a rather sharp pain at the inner surface of the left thigh. These continued even after he went to bed, and for some time after, his soles would tingle and burn, and he was obliged to pass his water very often.

These troubles increased, and gradually he found that there was an advancing loss of power in addition, and an unsteadiness in his walk, so that when in the fields he constantly stum-

¹ Virchow's Archiv, Bd. lxx. H. 2, p. 24 et seq.

² Archiv der Heilkunde, 1877, p. 352.

³ Leçons sur les Malad. du Syst. N. 4^e fascic., p. 279.

bled. There was also a disposition to kick up the dust with his toes as he followed the plough. He became worried, and with the advice of his brothers he consulted me.

I found that there was a well-marked history of insanity in the family, and that one of its members "died of paralysis." He has never had any nervous or other serious trouble, and there is no discoverable cause except, perhaps, that of exposure which had lasted for some time.

I carefully examined him and found that his upper extremities were entirely unaffected; and there was no diminution of muscular force. His gait was seemingly awkward when he was observed carefully, but not conspicuously so. He often stubbed his toes or scraped them against the carpet, and after walking across the room two or three times, complained of a "tightness" of the inner muscles of the thigh, and a sense of rigidity at the knee. In going down stairs he felt as if he would pitch forward. As he sat, his mind being diverted, I noticed that the feet were in a natural position; but as soon as he attempted to walk, there was an immediate rigidity. There was absolutely no diminution in the size of the legs or thighs, and the response to the galvanic current was excellent. The tendon-reflex was quite active in the adductors and quadriceps femoris; and when the feet were forcibly flexed alternately there was reflex clonics which continued for some time; but it was not so active in the left foot. Cremaster reflex was not increased, but the abdominal reflex could be easily excited. Urination was unaffected; and there was no impairment of sexual power. Cutaneous sensibility was perfect, although he still complained of painful sensations in the lower extremities; there was no ataxy or defective co-ordination.

These early pains, the gradual loss of power and the increase of the tendon-reflex, appear during a period which extends from a few months to a year or two; but the pains disappear usually with the commencing loss of power.

The next case will illustrate the onward progress of the disease.

D. O'N., æt. 28, married, United States, printer, admitted November 30, 1878.

Family History.—Mother died of consumption; father, who was a healthy man, was killed. Family consisted of ten children. One sister died of cholera, one brother was drowned, two died young from causes not mentioned. The rest are living and in

perfect health. No nervous diseases, no rheumatism, paralysis, epilepsy, or any hereditary diseases in the family.

Previous History.—Patient was perfectly well up to twelve years of age, when he had an attack of scarlatina. Immediately following this he noticed weakness of the right knee and hip, then of the left knee and hip; worked for three months and was forced to stop on account of weakness of the legs and pain in the back; and he would fall occasionally.

Three weeks after the onset he was obliged to use a cane; and at that time dragged his right foot to some extent. He would be stronger in the morning than at night. Never noticed his feet drawn up, but his legs would tremble. The toes were not flexed. In walking, his legs would become crossed, and his boots began to wear out at the toes first. No spinal epilepsy, no stiffness, or formications, no loss of sensibility, no shooting pains, no loss of co-ordination present. The bowels were constipated but not to a great extent. There was no incontinence of urine; but on laughing heartily there would be a slight dribbling, otherwise he had perfect control of his urine. There were no febrile symptoms, no jerking of the limbs, no contracture of muscles.

He continued to grow weaker in the legs for a year; then for three years he thought he had improved, and was not under treatment. He could walk with a cane, and was able to follow the occupation of peddler. His knees used to knock together, so much so that his trousers would be worn out, a fact which he noticed about two years after the onset of the disease. At the same time his right leg and foot became stiff and turned in. There was no trouble with the bowels or bladder.

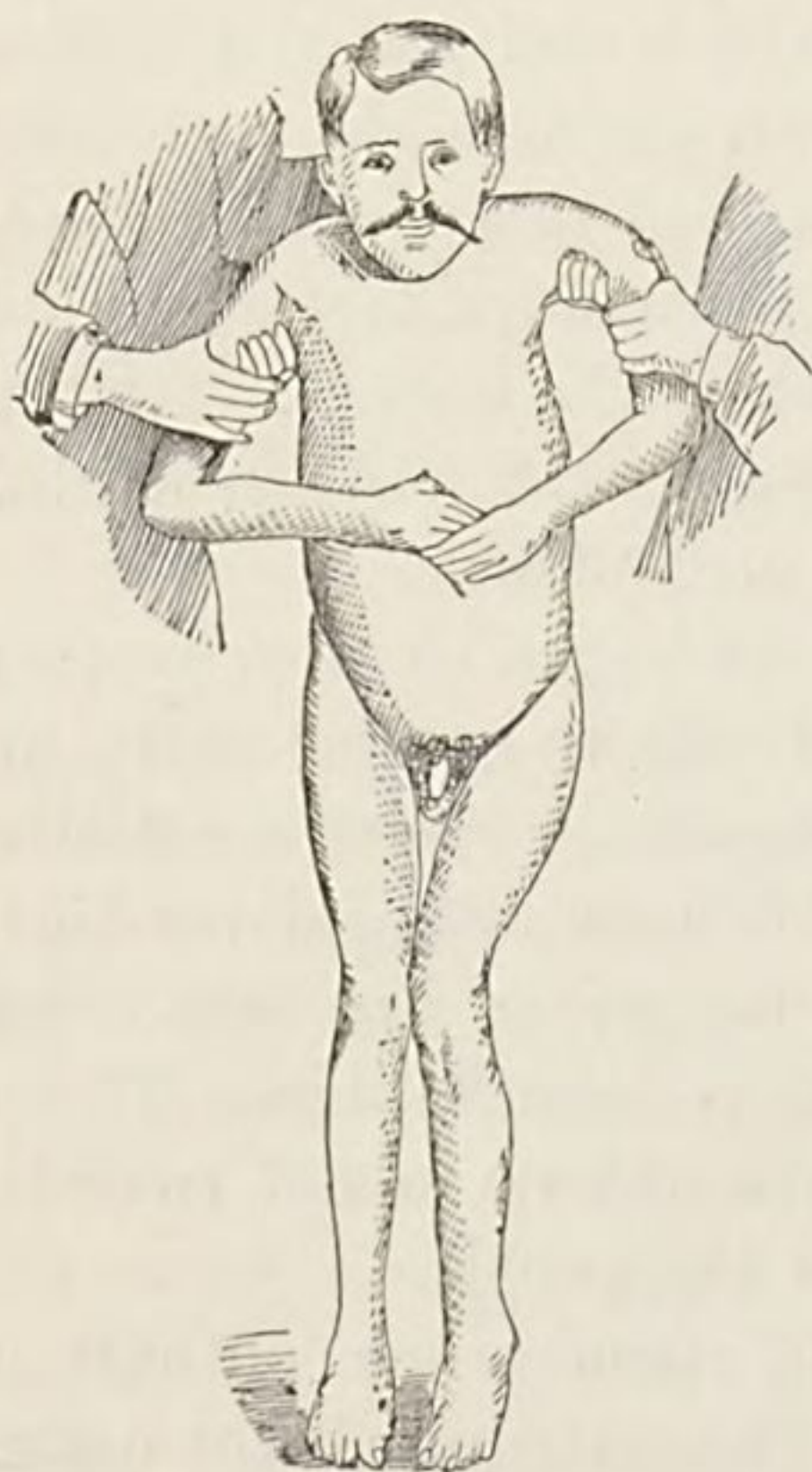
At the beginning of the fifth year he began to grow worse; and in a year or so later his left leg began to become stiff; he was obliged to pass urine often, and should he resist the desire he would have retention at night. He now dragged his legs, and would wear out the outer side of the toe of his boot. He was able to walk with a cane up to four months ago. There was no difficulty in walking in the dark and no loss of co-ordination. He never felt dizzy and never staggered.

Four years after the onset of the trouble he noticed a tremor of the legs, especially when he attempted to walk. Tendon-reflex was very much exaggerated at the time. As he was in the habit of patting his knees while resting, he noticed

it. He never felt a sense of constriction around the waist; has had occasional attacks of gastric disturbances for the last year or two. For the last four months he has grown worse. He never had bed-sores; his feet were never numb; had formications. During the last three or four weeks he has experienced pain in the back, and also gastric pains; appetite poor; special senses unaffected; no difficulty in speech or in swallowing; but has noticed when awaking in the morning that he did not know where his legs were.

Present State.—The patient is a man of small stature; has rather a dwarfish appearance; is fairly nourished, but has lost a great deal of flesh; is pale and anæmic. He cannot stand alone, can stand with difficulty with one cane, and by using two can walk a little. In walking he can lift the left foot from the ground but drops the right one; he walks on his toes. The knees strike together—so much so that the hairs are worn away; his foot describes a semicircular movement outward. He steps on the anterior part of the foot, squarely, not more on the outer than on the inner surface. There is no tremor, no ataxia, no festination, no staggering. The lower extremities are symmet-

Fig. 6.



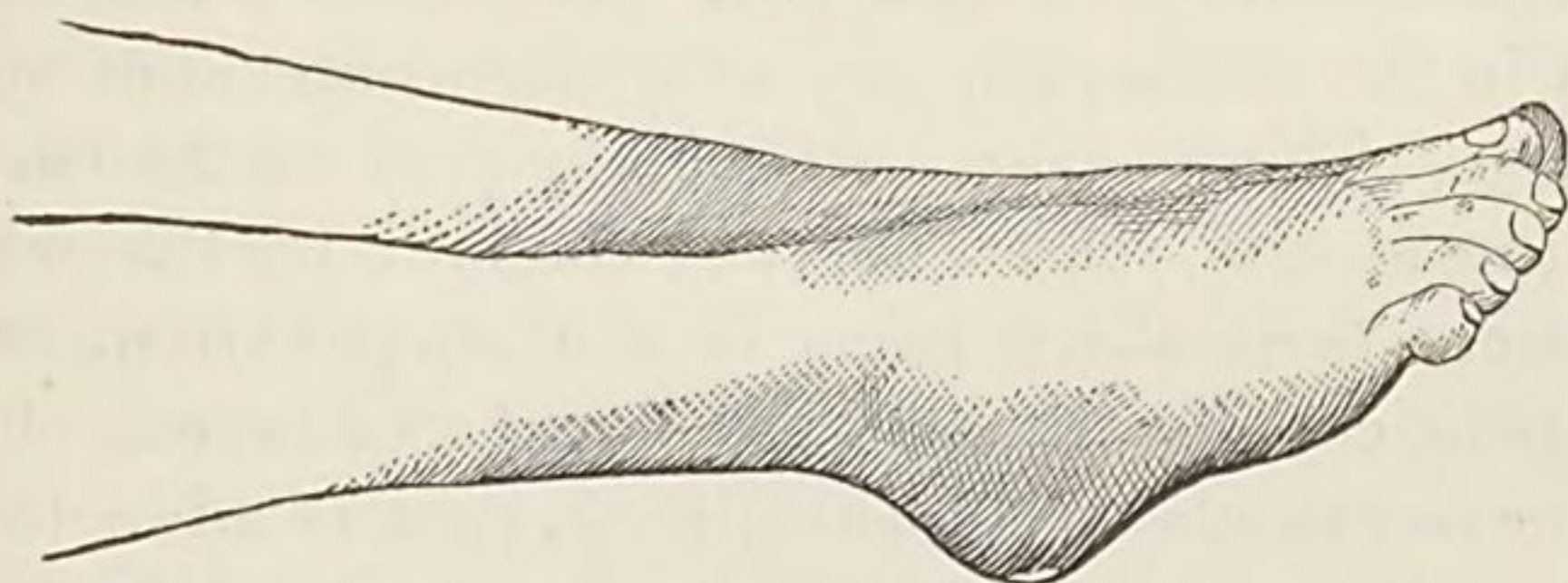
rically, though not unequally atrophied—not pathologically atrophied. The feet are cold, but there is no venous stasis; gait slow and causes pain in the back, and also in the left knee; the knees bend outwardly—at times so much that he almost falls. His feet are rigidly extended; his knees strike together and interlock, but he can move his feet far enough outwards to prevent them from interlocking in lying upon his back in bed. The knees are adducted; the feet touch each other when passively extended, and are adducted—all of which can be easily overcome. The joints of the knees and feet are stiff. He can lift his feet high up from the bed, but not against a slight resistance. In resisting a

force, or in extending or flexing the leg, he shows a considerable

loss of power. There is no loss of sensation as regards localization, pain, and temperature. Skin and tendon-reflexes exaggerated; epileptoid trepidation in the left leg is slight. When the foot is forcibly flexed it remains so for a moment against his will. There is retention, but no incontinence of urine; bowels constipated. The power in the right hand is a little stronger than in the left; there is no ataxia; sensation good, and special senses unimpaired. The tongue protrudes in a straight line without tremor; vision $\frac{2}{5} \frac{0}{0}$.

Patients who are in the advanced stage of this disease present

Fig. 7.



Contracture of Feet in an advanced Case of Primary Degeneration of the Lateral Columns.

in addition to great loss of power, contractures of advanced development; and as a consequence there is deformity which is always quite prominent.

Fig. 7 represents the foot of one of these patients. As will be observed, it is rigidly extended; and no reasonable amount of force will overcome the contracture.

The following case, before reported by myself,¹ is one of the confirmed type, and is interesting because of its rarity.

J. V. P., æt. 38, U. S.; silversmith.

Family History.—Parents alive and healthy. One brother died of “bone trouble,” another from some affection of the bowels, and a third from an unknown cause. One sister died who had been subject to epilepsy; and he has another who is in poor health. He does not know of any hereditary disease.

Previous Health.—He enjoyed good health up to his twelfth year; at which time he fell and injured his head, and was afterwards confined to his bed for a month in consequence, but subsequently made a complete recovery, and was well until the onset

¹ New York Med. Record, Oct. 1878.

of the *present trouble*. This began eight years ago (1870). He had been in the habit of going to balls and staying up late, but was not intemperate, either in sexual indulgence or drink. He first noticed a feeling of weariness after any slight exertion, when his legs would feel heavy and his feet sometimes burn. If he persisted in walking his legs would become stiff, and he often stumbled and staggered, and on several occasions fell. He would occasionally suffer from pains during cold weather, and spinal epilepsy. His general health remained unchanged, and he had perfect control over his bowels and bladder. At this time there were occasionally formications in his lower extremities, but never anæsthesia. No loss of power or incoördination in the hands, nor any affection whatever of the upper extremities. There never has been any pain in the back, affection of the special senses, nor any cerebral trouble whatever; neither were there sharp pains in the lower extremities. For two years he could walk alone; the next two he was obliged to use a cane or crutches. In June, 1875, he was admitted to the hospital, and was there enabled to move around by clutching chairs or other articles of furniture. He was put to bed and remained there for a month.

About five years ago his feet began to grow stiff, and extended so that he was obliged to walk on their tarsal surfaces—not being able to touch his heels to the ground. About the same time, he noticed difficulty in writing and in using his knife and fork on account of *clumsiness* of his hands. There never has been any constricting band about the waist.

Present State.—Jan. 1st, 1879, he is in good general health; appetite good, complexion clear, and lips bright red. He usually sits in an arm-chair, very much bowed over, the head in advance of the body, but he is able to move it freely. The abdominal fold, so well described by Charcot, is conspicuous. The belly is prominent; and at the lower border of the ribs is a fissure which extends across the body. The patient cannot straighten himself, though there is no vertebral disease—the spinal column being in no way affected. The thighs and legs are rigidly extended and adducted, and the feet are also stiffly extended. The arms are not involved. When told to raise his heels from the floor when sitting, he is unable to do so for more than six inches, and the rigidity which follows prevents them from falling to the ground immediately, as the muscles upon

the anterior aspect of the limbs seem to contract. The feet are somewhat inverted, and by using some force, passive motion is possible; but he cannot move them himself, neither can he abduct them, nor cross his legs.

The muscular rigidity seems to be greatest in the supine posture, and he complains that it is especially troublesome in the night. The joints are well developed, but there is no arthropathy. He cannot now stand or raise himself from his chair but when assisted and held on his crutches; the characteristic appearance of the lower extremities is well shown. He then stands upon the metatarso-phalangeal part of the foot; and in attempting to walk he painfully drags his feet; and with difficulty forces one ahead of the other, when, by action of the adductors, they become interlocked, and he is obliged to have them disengaged.

In this case reflex excitability is good; that of the tendons is quite marked. The act of standing produces quite decided epileptoid movements, and these follow forcible flexion of the feet. Slapping of the muscles of the leg induces fibrillary contractions and movements of the toes. *The tendon-reflex varies.* At times a slight tap upon the tendons of the quadriceps or patella will be followed by a vigorous kick. A tap upon the tendo Achillis will cause the heels to be raised, and the tendon of the triceps, when struck, will be followed by quite appreciable contractions. If the finger be passed ever so lightly over the abdominal parietes, there will follow a general but uneven contraction of the abdominal muscles. Electric irritability of the muscles is fair. There is no conspicuous atrophy—no more than would occur from disease; and this loss of substance is general. The power in the hands seems to differ, for with the dynamometer he can force the index to 100° C. with the right hand, and 90° C. with the left. There is slight clumsiness, not amounting to ataxia. The bowels are now slightly constipated, probably owing to his sedentary life; but his micturition is attended with considerable increase in the force of ejaculation.

His cutaneous sensibility is slightly impaired; and there is anæsthesia and analgesia, but no plantar anæsthesia. The skin of his legs is sometimes mottled and cold. His eyes were examined very carefully, and there is no evidence whatever of any disease at the fundus. The pupils dilated evenly; vision by test

types $\frac{2}{3}$. No ocular muscular trouble whatever; and there never has been diplopia or strabismus. He protrudes his tongue in a straight line. His mental condition is good.

Let us briefly discuss the appearance of, and variations in the manifestation of the symptoms.

We have already dwelt sufficiently upon the presence of the early pain; therefore, nothing more need be said on that point. As to the loss of power, it will be noticed that, in nearly all of the reported cases, the lower extremities (see table) were affected in the beginning, although it is not rare to find either hemiplegic cases, or those beginning on one side and afterwards involving the other—this extension occupying a long period of time.

Again, the upper extremities are sometimes affected first; but these cases are extremely rare—I can find but two mentioned. It, however, follows that when the loss of power begins below, the arms are quite likely to be affected; so that the contractures, trepidations, and all the symptoms already shown below are likely to appear in the upper extremities after two or three years. Even the muscles of the trunk, as shown in the case just presented, are finally implicated.

Bétous makes the third stage of the disease include general contractures of the upper and lower extremities and trunk muscles.

The loss of power can hardly be called an absolute paralysis, for the paresis is unequal, and the patient possesses for a long time a great deal of ability to perform certain actions with a great deal of ease, while others are impossible.

Motor irritation is a feature of the second stage of the disease, and accompanies the paresis. The first indication of stiffness marks the appearance of this symptom, and a variety of irregular disorders of motility follows, such as twitching of the feet, tremor amounting to almost clonic spasms when the toes are allowed to touch the floor, and rigidity when passive movements are made; then other phases of excitement in muscular action are exhibited in different degrees and at different times until the disease has run an extended course. I have then found that in some old cases the *clonic* movements following excitation are not so active as in the early stages, but that spastic contractures apparently uninfluenced by any ordinary excitation,

exist, and also that there is no apparent increase of rigidity in connection with the excitation of any special movements.

As to the negative symptoms of the disease, there is little to be said more than what has been stated in the section on general symptomatology. It may be said, however, that there is no impairment of the sexual power.

The disease ultimately reaches a stationary period ; and unless there be lit up a myelitis which ascends and involves the bulb, the patient is likely to live for years, finally to die from an intercurrent disease.

After the stationary period is reached, he is, perhaps, helpless and confined to his bed. His contractures may become painful, and in general, his health suffers through inaction and want of exercise.

In some cases the attempt to stand is attended with great suffering, as the toes are flexed ; and when the entire weight of the body is thrown on them in this constrained position, the patient is often unable to progress even with the aid of a stick or crutches without great agony.

I have noticed in connection with the other symptoms in two of my cases, a great deal of emotional disturbance, which at times amounted to hysteria ; and I am inclined to think that this is but another illustration of the appearance of hysteria in connection with organic nervous disorders, such as have been so clearly described by Charcot and others.

An Analysis of 39 Cases of Primary Degeneration

Reported by	No.	Age.	Sex.	Pain, etc. Early sensory troubles.	In what limbs did paralysis begin?	To which did it extend?	When did disease begin previous to treatment?	When contrac- tures, and in what limbs?	Where was tendon reflex found?
Wilhelm Erb.	1	44	M	Stiffness of calf and upper thigh, with increasing uncertainty, and stiffness in walking. No pains or paræsthesia of any kind.	Calf and upper thigh.	.....	1 year.	About four w'ks before treatment, in legs.	Patellar and Achilles tendons. Violent clonus, with passive dorsal flexion of foot Adductors, biceps femoris, triceps brachii.
Wilhelm Erb.	2	51	M	Pain in hips, legs, back; afterwards arms.	Legs.	Arms.	4 years.	Slight contractures of arms one year ago.	Reflex of skin increased.
Wilhelm Erb.	3	35	M	Weakness of right leg. No pains, no paræsthesia.	Right leg.	Right arm.	6 mos.	Occasional contractures of leg from beginning of disease.	Right reflexes strongly increased. Strong reflex of patellar tendon; strong clonus of foot and adductors; more moderate of biceps femor., and tibialis posticus; strong patellar reflex left side, but no clonus; no dorsal clonus of foot; strong reflex of Achilles; weak of adductor.
Wilhelm Erb.	4	49	M	Pains of legs and back. Sensibility of skin and muscles perfectly normal. Slight feeling of deafness and tickling of ears.	Left leg and arm.	Right hip.	1½ y'rs.	Contractures of left arm and leg since half year.	Left patellar tendon and clonus. On knocking, the tibia contraction of quadriceps. Dorsal clonus of both feet; slight reflex of adductors. In upper extremities exquisite reflexes of triceps, biceps, supinator longus, etc.
Wilhelm Erb.	5	30	F	Weakness of legs; no pain.	Legs.	Arms.	5 years.	On passive dorsal flexion of foot violent clonic contractions.	Reflex of skin of legs somewhat increased.
Wilhelm Erb.	6	43	M	Weakness in left leg.	Left leg.	Left arm, back, and right leg.	5 years.	Time not stated. (Lately.) Legs.	Patellartendon, dorsal clonus of feet, adductors.
Wilhelm Erb.	7	46	M	Rheumatic pains in back and legs.	Left hand.	Left arm and leg.	15 y'rs.	1 year. Calf muscles of leg.	Patellartendon, clonic contraction of quadriceps, dorsal clonus of both feet, adductors, semi-tendinosus, biceps femor, semi-membranosus, triceps, biceps.
Wilhelm Erb.	8	25	M	Weakness in arms and legs; sometimes pains in shoulder-blades and head. Feeling of dizziness.	Arms and legs.	Shoulder-blades.	3½ y'rs.	Legs (time not specified).	Patellar and Achilles tendons.
Wilhelm Erb.	9	35	M	Pain in left leg.	Left leg.	Right leg.	2 years.	.....	Patellar and Achilles tendons. Dorsal clonus of feet; reflex of adductors; slight reflex of tibialis posticus and anticus.

of the Lateral Columns of the Spinal Cord.

Other prominent facts in history of case.	Cause of disease.	Occupation.	Treatment.	Result of treatment.	Physical condition and personal appearance of patient.
Muscles well developed, without a sign of atrophy; adductors in a condition of great tension. Sexual functions diminished, but not lost. All nerves of brain, intelligence, memory, etc., normal.	?	Laborer.	Galvanism.	At first decided improvement, afterwards but slightly improved.	Average height; healthy appearance; well nourished.
Nerves of brain normal. Almost complete paralysis of legs; feet dragging when walking, in consequence of reflective tension of muscles of calf. No urinary troubles.	?	Peasant.	Galvanizat'n of back, with sympathetic of neck.	Discharged much improved. Said to have completely recovered since	Stoutly built; healthy.
Functions of bladder normal. Upper extremities in regard to sensibility normal. Motility of right arm slightly weakened. Sexual functions retained; libido sexualis somewhat diminished. Normal urine, without albumen or sugar. Never had syphilis. No sexual excesses.	Possibly over-exertion.	Barber.	Galvanism.	None.	Somewhat sickly looking man; average height; moderately developed muscles.
Urinary system, nerves of brain, and physical functions perfectly normal.	?	Laborer.	Galvanism of vertebral column and legs.	Discharged much improved.	Well-nourished, fine-looking man.
No urinary troubles. Nerves of brain normal.	?	 / .	Galvanizat'n of back, with sympathetic of neck.	Discharged much improved.	Average height; badly-developed muscles.
Paresis of both legs; dragging, uncertain walk. Right arm not attacked. No weakness of bladder or sexual functions. Reflex of skin normal. Sensibility of muscles retained and normal. Vertebral column straight.	?	Teacher.	Galvanism and cold water treatment.	No appreciable improvement.	Pale; somewhat weak; has hemorrhoids; overworked; much headache.
Movement of head, neck, and vertebra good, but somewhat slow. Speech and power of swallowing impaired. Sexual functions normal. Heart and lungs sound.	Repeated colds.	Peasant.	Galvanism.	No appreciable improvement, except in speech and power of swallowing.	Large, heavy man, with massive bones and immense muscular development; well nourished.
No dorsal clonus; no atrophy of muscles; normal vertebra; no syphilis or sexual excesses.	?	Farmer.	Galvanism.	No appreciable improvement.	Stoutly built; healthy color.
Slight urinary disturbances. Sexual functions at one time diminished. Upper extremities normal. Depression of galvanic irritation of both peronei.	Working for years in cold, damp rooms.	Carpenter.	Galvanism.	Slight improvement.	Stoutly built; somewhat pale.

An Analysis of 39 Cases of Primary Degeneration

Reported by	No.	Age.	Sex.	Pain, etc. Early sensory troubles.	In what limbs did paralysis begin?	To which did it extend?	When did disease begin previous to treatment?	When contrac- tures, and in what limbs?	Where was tendon reflex found?
Wilhelm Erb.	10	43	M	Weakness of legs.	Legs.	Arms.	Some months.	?	Dorsal clonus of feet.
Wilhelm Erb.	11	50	F	Weakness of hips and right leg.	Right leg.	Left leg.	2 years.	?	Patellar tendon, dorsal clo- nus, adductors, tibialis anticus and posticus.
Wilhelm Erb.	12	25	F	Weakness and trembling of legs.	Legs.	.....	Felt weak- ness in walk- ing when a girl.	Legs at different times.	Dorsal clonus of feet.
Wilhelm Erb.	13	36	M	Pain in both legs and back.	Legs, especi- ally left.	Arms.	3 years.	Calves of legs (time not speci- fied).	.....
Wilhelm Erb.	14	24	F	Trembling of legs, with pain.	Lower extrem- ities.	.....	?	Lower extremi- ties (time not specified).	.....
Wilhelm Erb.	15	37	M	.....	Both legs.	.....	7 years.	.....	.....
Wilhelm Erb.	16	46	F	.....	Lower extrem- ities.	.....	.....	.....	.....
Wilhelm Erb.	17	..	..	?	Legs.	?	?	?	Adductors, tibialis anticus, etc.
Wilhelm Erb.	18	2	F	Weakness of legs, with pain.	Legs.	?	1 year.	Adductors.	Reflexes of tendons in- creased.
Wilhelm Erb.	19	16	F	Dragging of left foot since childhood; in- creased after puberty.	Left foot.	Both legs.	Since child- hood.	Knee.	Patellar tendon; triceps.
Berger.	20	36	F	Stabbing pain in back and limbs. No ob- jective sensory troubles.	Legs.	.....	1 year.	Legs.	General tendon reflex.
Berger.	21	36	F	No pain in back and limbs. No objective sen- sory troubles.	10 w'ks after fall, weak- ness of legs, es- pecially left.	Left upper extrem- ity.	9 mos.	.....	Repeated trembling of left leg; knee phenomenon, with rigidity in ankle; also tendon reflex in- creased.

of the Lateral Columns of the Spinal Cord.

Other prominent facts in history of case.	Cause of disease.	Occupation.	Treatment.	Result of treatment.	Physical condition and personal appearance of patient.
Uncertain, somewhat spastic walk.	?	Merchant.	Galvanism and cold affusions.	Almost completely cured.	?
Cessation of menses some years ago. Slight antifixion uteri. Paresis of both legs. Dragging of feet. No ataxy. Arm and head free; back very weak. Vertebral column straight, flexible, painless.	?	.....	Galvanism.	Slight improvement.	Somewhat nervous, but, generally speaking, healthy.
No paræsthesia; no hysterical symptoms. Case presented the aspect of transverse myelitis. Vertebral column normal. Is under the influence of hereditary neuropathic trouble; sister hysterical and weak minded, cousin paraplegic.	Strong hereditary predisposition.	.....	?	?	Moderately well-nourished woman.
No paræsthesia. Sexual power said to have increased, if anything, since beginning of disease. Frequent and strong erections. Upper extremities normal. No urinary troubles.	?	Peasant.	.....	.....	Very stoutly built man, with enormous muscular development.
Sensibility normal. No urinary troubles. Head and upper extremities normal. Formerly hysterical and somnambulistic condition.	Hysteria.				
Sensibility normal. No atrophy. No urinary troubles.					
Hysterical symptoms. Fibroid uterus.	Said to be fright.				
No weakness of bladder. Arms free. Head and eyes normal. Vertebral column straight and flexible, without any anomaly. Healthy parents.	.....	.....	.....	.....	Well-developed and nourished, beautiful child.
No atrophy. Sensibility of skin normal. Arms free. Functions of bladder, vertebra, and brain normal. Not hereditary.	.....	.....	.....	.....	Normally developed child.
Upper extremities as to mobility and sensibility normal. Regular menses. No paræsthesia.	.....	.....	Galvanism.	None.	Well-developed, healthy-looking girl.
Sensibility normal; ischuria; no ataxia.					
Great coldness of feet. Slight dizziness. Skin reflex diminished. Anorexia. Normal electrical irritation.	Fall.				

An Analysis of 39 Cases of Primary Degeneration

Reported by	No.	Age.	Sex.	Pain, etc. Early sensory troubles.	In what limbs did paralysis begin?	To which did it extend?	When did disease begin previous to treatment?	When contrac- tures, and in what limbs?	Where was tendon reflex found?
Berger.	22	38	M	Hemicrania; pain one month after in soles of feet; weak in left.	Left leg, with stiff- ness.	Left arm; 1 year after- wards in right arm and leg.	About 11 y'rs.	Adductors of thighs.	Trembling of both legs; foot and knee phenomena.
.....	23	18	M	.....	Legs.	.....	4½ y'rs.	.....	No characteristic symp- toms.
Richter.	24	..	F	Neuralgia of lower extremi- ties; headache; formication.	Para- plegia of legs after acute disease.	.....	.....	None.	Not stated.
Richter.	25	21	F	Backache and formication.	Legs.	.....	Several years.	Muscular ten- sion noticed after passive movement in knee. Cramps in legs.	Not stated.
Richter.	26	40	F	Coldness in legs; formica- tion; pain in back.	Legs.	.....	7 years.	Legs.	Violent tendon reflexes fol- lowing electrical excita- tion.
Richter.	27	30	F	Neuralgia; pain in back; hyper- æsthesia of skin.	Legs.	Trunk, could not sit.	7 mos.	Abduction and cramps of legs.	Violent tendon reflexes fol- lowing electrical excita- tion.
Gray.	28	30	M	Pain in right hip; weakness in lower ex- tremities; sup- ple in early part of day.	Lower extremi- ties.	Right arm.	2 years.	.....	Quadriceps extensores most in right; in extensor longus dig. on right.
Gray.	29	32	M	.....	Lower extremi- ties.	.....	10 y'rs.	.....	Both quadriceps exten- sores most on left. Epilep- toid tremor on standing.
Hamilton.	30	28	M	Burning pains in feet.	Lower extremi- ties.	Upper extremi- ties, slight.	.....	Contractures of tendo Achilles.	Quadriceps, tendo Achil- les, skin and abdominal reflex. Epileptoid move- ment follow standing.
Schulz.	31	29	..	Pain in legs; stiffness of knee.	Legs and knee.	Superi- or ex- tremi- ties.	2 years.	.....	Active reflex of foot and leg phenomenon; rhythmical tremor of foot; patella, Achilles, adductors, reflex following blow on inner condyle of tibia. Biceps of both legs. Biceps hu- meri; sup. longus exten- sors, more of right than left. Tap over 7 cervical vertebral spine produces tremor in arm. Pectoral muscle. Rhythmical movements in hands and fingers.

of the Lateral Columns of the Spinal Cord.

Other prominent facts in history of case.	Cause of disease.	Occupation.	Treatment.	Result of treatment.	Physical condition and personal appearance of patient.
Normal electrical reaction; extension to bulb. Some nystagmus. Incipient atrophy of optic disk. No loss of sensibility.	Exposure when in heated condition to wind.				
Chorea major in beginning; speech disturbance and mental trouble.					
No atrophy; no loss of sensibility; fibrillary twitchings; vasomotor troubles; no brain troubles; vision slightly impaired; no bladder paralysis nor decubitus. Normal electrical reaction, but tremor followed the use of electricity. No troubles of co-ordination. "Spastischer Gang."	1. Strong predisposition; mother insane; sister hysterical. 2. Acute gastritis.	.....	Electrotherapy.	Cured.	
Coldness in feet, and no anæsthesia; no bladder trouble or decubitus; no hysteria; electrical reaction normal; no ataxia.	1. Hereditary predisposition; father died of sclerosis. 2. Exposure.	.....	Hydropathy and electrotherapy.	Cured.	Anæmic.
Gastric neuralgia; no ataxia; brain functions normal; electric examination normal; no anæsthesia; no bladder trouble or decubitus; no atrophy. Former electric treatment injurious. Walk gradually improved.	1. Hereditary. 2. Cold and diarrhœa.	.....	Galvanization of sympathetic, and warm baths, etc.	Greatly improved.	Anæmic.
Irritability, yawning, vomiting, etc. Woman became pregnant, and forceps were used. Trouble dated from childbirth. Vasomotor disturbances, including a change in color, sweating, etc., of legs. Incontinence; no decubitus; utterly helpless; electric sensibility and contractility normal.	Hereditary; father died of brain trouble.	.....	Electrotherapy, spinal galvanization, and warm baths; local treatment of legs by induction current.	Generally improved; patient was finally able to walk.	Anæmic and hysterical.
No disturbance of sensation; pain in right trochanter, with changes of temperature. No cerebral symptoms.	None.	Car driver.			
Festination. "Spastischer Gang." Dorsal clonus. Bowels normal. Forcible ejaculation of urine.	.....	Clerk.			
Perfect control over bowels and bladder. No anæsthesia. Body bowed over. Adduction forcible.	Traumatism.	Silversmith			
Bowels and bladder healthy sometimes. Musca volitantes. Retina normal. Sensibility intact. Temperature normal. No ataxia.					

An Analysis of 39 Cases of Primary Degeneration

Reported by	No.	Age.	Sex.	Pain, etc. Early sensory troubles.	In what limbs did paralysis begin?	To which did it extend?	When did disease begin previous to treatment?	When contrac- tures, and in what limbs?	Where was tendon reflex found?
Schulz.	32	29	M	Backache; stiff- ness and pain in legs and right knee.	Right arm.	In 1870 to left leg.	8 years.	Left arm strong- ly flexed; fin- gers contract- ed. In arm, knocking or bending pha- lanx produces slight exten- sion of fingers and hands on both sides.	Quadriceps femoris, tib. ant. right leg.
Schulz.	33	37	M	Pain in back, arms, legs.	Legs.	Arms.	1 year.	.....	Patella, biceps, sup. long., triceps, deltoid.
Schulz.	34	59	M	Backache.	Legs, right most affected	Left arm; subse- quently both arms.	.....	.....	Dorsal clonus.
Bétous.	35	37	M	Lead colic and pains in legs.	Lower extrem- ity.	.....	9 mos.	Legs and thigh.	Trepidation extending to upper extremities.
Bétous.	36	49	F	Vague pains; backache.	Left leg.	Right leg; 1 month after- wards to upper extrem- ities.	14 y'rs.	Contracture and extreme flexion of fin- gers.	.....
Bétous.	37	55	M	.....	Lower extrem- ities.	18 years after to upper extrem- ities.	Began insidi- ously in 35th year.	Contracture of lower extrem- ities 1 year after debut, with ex- aggerated ad- duction of knees.	Spontaneous trepidation.
Bétous.	38	45	F	Lumbar pain.	Simul- taneous paraly- sis of both legs.	Pro- gres- sive ri- gidity of lower extrem- ities; 2 years after- wards, paresis and contrac- tion of inferior extrem- ities.	Debut at 43 years.	Contracture of superior ex- tremities 2 y'rs after debut. Great contrac- tion and adduc- tion of inferior extremities. Contracture of abdominal muscles, and permanent con- traction of fin- gers, with ex- treme flexion of hands.	All muscles of upper and lower extremities. Pro- voked trepidation.
V. Stoffella.	39	78	F	.....	Lower extrem- ities.	.....	.....	Rigidity in ad- ductors of both thighs.	Foot phenomenon. Exqui- site patellar reflex.

of the Lateral Columns of the Spinal Cord.

Other prominent facts in history of case.	Cause of disease.	Occupation.	Treatment.	Result of treatment.	Physical condition and personal appearance of patient.
No atrophy. No bladder or bowel disturbances. Sensation good in arms and legs. Muscular sensation good. Arm free from ataxia. Electrical reaction normal.	Hereditary ; onanism and confinement to bench.	Shoemaker.			
Bladder, etc., healthy. No atrophy. Sensation normal. Cranial nerves healthy. Passive flexion produces stiffness. Has erections. Slight affection of speech.					
Has erections. Tremulous walk. All negative signs.	.....	Butcher.			
Slight loss of power. Preservation of sensibility. Patient developed tuberculosis.	Lead poisoning.	Painter.			
Previous good health, with exception of hysteria. No atrophy, except from disuse. Sensibility intact.	.....	.....	Hydropathy.	.....	General health good.
.....	Fatigue and exposure to cold.	Colporteur.			
Integrity of sensation.	.....	.....	Hydropathy.	Amelioration ; subsequently transverse myelitis, bed sores, etc.	
Unimpaired intelligence ; no ataxia. Cutaneous reflex irritability not greatly increased. Electrical reaction bladder and bowels normal. Had left pneumonia 3 years ago.	.....	.....	.....	Patient subsequently died.	

V.

SECONDARY DEGENERATION OF LOCAL ORIGIN.

- a.* As a consequence of Spinal Disease.
- b.* As a consequence of Extra-Spinal Disease.

A careful inspection of the cases of spinal disease at any large hospital must impress upon the observer the fact that, there are many cases of spinal concussion or congestion, in which there is a primary affection, generally slight, of the entire cord, affecting not only motion but sensation, as well as the functions of the bowels and bladder; and that these symptoms may, one by one, subside, leaving two or three which show that the lateral columns remain involved.

These cases have been roughly grouped under the head of transverse myelitis; but in many cases I am convinced that the term is wrongly applied, and that nicety in diagnosis requires a still further subdivision of myelitis in cases where no permanent symptoms of general disorganization remain.

So, too, there are examples of trouble beginning in other parts of the cord than the lateral columns, and extending, eventually, from below upwards, and *vice versa*, occupying either the wedge-shaped space, which included the crossed-pyramidal columns and direct cerebellar columns together; or, on the other hand, extending to a different level by the crossed pyramidal or Fleischig's columns alone.

Such factors of secondary disease may be besides traumatic myelitis, blood effusion, tumors, sclerosis, and compression. In the upward extension, the direct cerebellar tracts are usually involved, while in the descending form, the inner bundle of fibres constituting the columns of Fleischig, is, according to Erb,¹ the part which is the seat of a morbid process; and in both cases the degeneration is usually bilateral, except when the result of a tumor, or a limited effusion of blood.

According to Erb,² the ascending secondary degeneration presents no new clinical features in addition to those of the original disease, except in the case of involvement of the posterior columns and nerve roots, when such peculiar sensory disturbances

¹ Cyclop. of Prac. Medicine, vol. xiii. p. 763.

² Op. cit. p. 774.

as burning, tingling, etc., are expressed; and he looks upon the autopsy as the only means of clearing up the question.

The following case will, I think, place the matter in a different light.

CASE.—Primary concussion of the cord; transverse myelitis; subsidence of all general symptoms; appearance of symptoms of degeneration of the lateral columns.

T. T., æt. 24, single, brakeman. Admitted May 6, 1875.

Family History.—Good.

Previous History.—Patient on the 20th of October, 1872, while walking on a freight train in an opposite direction to that in which the train was going, came in contact with a covered bridge when the train was moving at the rate of fifteen miles an hour. He was struck on the back between the shoulders, and thrown a distance of ninety feet, striking upon another car, but did not fall to the ground.

There was no laceration of the soft parts, except a partial flesh wound on the scalp, of which no scar was left. He was taken to Steubenville Hospital (Ohio) completely paralyzed. The paralysis was general, he being unable to move hand or foot.

After three months in the hospital, he was taken to his home in New York city, but little improved. Could move the toes of right foot. He then spent eight days in the Sisters' Hospital, New York, after which time he returned to his home, and there remained five months, when he was treated by his family physician, who used the battery from four to five times a day—each time from ten to fifteen minutes. Under this treatment he was very much improved, and says he could perform the movement of pronation and supination of the right forearm.

In the mean time his left arm began to improve, but very slightly.

In this condition he was admitted to the Jersey City Charity Hospital, where he remained five months, and could at length walk with the aid of crutches, his right arm being so much improved that he no longer required any one to feed him.

He then returned to his home in New York city, and pursued the same treatment as before. After remaining home two months, he was sent to Charity Hospital on January 20, 1874. He was under treatment for two months, taking the sulphate of strychnia. Afterwards, he says, he remained in the hospital

until he was transferred, without any treatment whatever after the first two months, and that he does not observe any improvement since he came to the hospital.

June 13, 1875. Patient better since admission; walks without the aid of a crutch; all limbs are weak; palsy most marked on left side, arm, and hand. Only symptoms about head are slight difficulty of speech, and occasional partial aphonia—not from cold—disappearing in three weeks; no headaches; no eye symptoms; no difficulty of swallowing. Voluntary movements nearly perfect in right upper extremity. Left arm can be half raised; motion at both elbow-joints good; all voluntary movements in right hand possible; some trembling accompanies movements; extension of fingers difficult. Movements of wrist of left hand limited, especially extension; fingers are semiflexed, flexion and extension incomplete—about equal in all joints; extension less perfect in third and second phalanges; very little atrophy. A general wasting of left hand, apposition of thumb and first finger of left hand impossible. Sensibility of hand good; numbness was present four months ago in both hands—none since. Reflex movements exaggerated in both arms; more so in left; slight jerking in left arm; co-ordination good.

Thorax.—Fair action of upper intercostals, and excellent diaphragm contractions. Abdominal muscles act well.

Lower Extremities.—Voluntary movements normal in extent; limited movements in all joints on left side; left heel can be raised six inches from bed. Left leg is the seat of marked “spinal epilepsy;” slight irritation produces reflex movement. No abdominal reflex movement in right leg for more than two years. Slight general wasting of left lower extremity; no localized atrophy; no numbness of legs since four months after accident. Strength at right knee-joint is normal; less than normal at left. He says he walks on whole of left foot. When lying down there is slight talipes equinus. Sensibility, coarse test, good. He can hold his water two or three hours; but after the sensation is felt, he wants to pass it immediately; has erections. From onset has been constipated, and has involuntary but not unconscious passages.

Spine.—Vertebral prominence apparently more conspicuous than usual, because of depression just above it. Another irregularity noticed at the third or fourth cervical vertebra consists in thickening and prominence of bone posteriorly.

Diagnosis.—Fracture of the third and fourth cervical vertebra, pressure on cord, secondary localized myelitis with localized degeneration of left lateral column.

Nov. 8, 1875. There are no symptoms about the head; voice perfectly natural. The right arm has improved considerably; says he occasionally has a prickly sensation in the right hand which makes his arm twitch. Sensation is still somewhat diminished. The left arm still shows great loss of muscular power, though it has much improved since admission. Sensation is nearly normal. Dynamometer shows right hand 80, left 20.

Thorax.—Very fair action of intercostal muscles, apparently perfect action of the diaphragm.

Lower Extremities.—In the right leg motion has improved, being nearly normal; gets stiff in cold weather. Sensation is improved somewhat. Left leg also shows signs of improvement, by patient being able to take a full step, and support himself with it. Sensation is very near normal. Passes urine about four times a day, and six times at night.

October 14, 1878. Patient is emaciated and anæmic; thinks that he has lost flesh during the last three years, but that his back is stronger and he can now sit on a stool, formerly could not sit in a chair without a back, ankle of left foot used to turn in but does not now. Has had occasional formication of legs; but numbness has disappeared. Can walk with crutches at least half a mile without resting. His left foot used to strike the toe first; he now strikes foot flat on the floor. Passes urine four or five times a day, and at night every hour or two if cold, but if warm three or four times a day and two or three times at night. Can hold urine half an hour or so after inclination. Can button his clothing very well. Has no numbness except at long intervals in arms; no jerking of the muscles of the arms or legs; three years ago would be obliged to have legs tied down or they would jerk up and remain contracted at night. Had shooting pains in the back three years ago; none now. Memory good; never was impaired. Never had headache; had some difficulty of hearing in left ear; thinks it has improved. Never had impaired sense of taste nor smell, no twitching or paralysis of the face. Speech at present is perfect; has always had palpitation of heart; thinks he has lost height since accident; body is as straight now as it was three years ago; no

swelling of joints; had an eruption three weeks after the accident, which lasted three or four weeks. Doctor said it was not syphilitic. Patient has blepharitis in both eyes. Has had several attacks of dysentery. Does not perspire freely. Can raise himself from chair with the aid of his hands and can stand alone. Power of hands is fair but diminished, both about equal; right may be a little the strongest. Power of extension fair, but is diminished; can flex slightly but cannot abduct or adduct; attempting to perform these motions causes violent tremor. Skin cold; muscular sense good. Coördination on standing is slightly impaired, but he can stand with eyes closed. Sensibility impaired to a very slight extent; anæsthesia and analgesia,¹ right side worse. Skin reflex is increased, but it is delayed for two or three seconds. Sense of touch is not delayed; but such is not the case as to sense of pain. Tendon reflex of right leg violent but single; of the left leg is increased to twenty or thirty times. Can tell when the hair of legs is pulled, and can distinguish between upward and downward strokes of the finger. The right leg measures in circumference twelve and a half inches, the left leg twelve inches.

Power of hand by dynanometer: right 80, left 15. The fingers and thumb of left hand are flexed; can extend them a little but not much; wrist is also flexed. Sensibility of both hands normal; tickling of the back of both hands causes violent reflex action; tickling of the palms of the hands causes flexion of the thumbs.

One of Seguin's cases presented symptoms indicative of primary general myelitis, and subsequent predominance of those referable to disease of the lateral columns. Case IV. is of this kind. The patient had had syphilis, became suddenly paraplegic, had a bed sore, anæsthesia, was unable to control his bladder and rectum, and there was excessive reflex action. Two years later (1872) his disease changed entirely, and the indications of spastic disease were all pronounced. There was perfect coördination, and the only bladder trouble was one of a nature in which the urine was violently and perceptibly voided. Surface sensibility was perfect except slight loss of tactile sensibility in the feet.

As to the cases in which the degeneration extends to the

¹ This is hardly perceptible.

lateral columns as a result of disease of the membranes, the interesting observations of Voisin¹ may be cited:—

Copin was thirty-six years old; and she had been insane and confined in Lariboisière several times for attacks of acute mania. Two years ago, she had headaches and great mental disturbance, and was finally sent to La Salpêtrière. She had had attacks of loss of power during the previous five years, and had several times fallen to the ground; and she stumbled when she walked. With this there were pains in the legs.

She was a large plump woman, and presented a right-sided hemiplegia of old date. Her face was drawn up on the left side, and the tongue pointed slightly to the right when protruded. There was no strabismus, no head symptoms; pupils equally contracted, vision normal. She cried when the inferior extremities were touched, and complained of pains over the sacrum where there are two large cicatrices of former bedsores. Power was very much impaired in the lower extremities, and a little in the right upper extremity—the result of old hemiplegia. Electric muscular contractility seemed perfect; surface sensibility in all four members unimpaired. Her only trouble was pain in the limbs.

Pressure on the third, fourth, fifth, and sixth dorsal spinous processes gave rise to intense pain. The patient's condition became somewhat serious. A heart murmur was heard with the second sound over the mitral valves.

Diagnosis: *Subacute meningo-myelitis*, and old right hemiplegia, with lesion in left corpus striatum.

Nov. 10. A bed sore appeared.

12th. Intense fever.

13th. Pain in both lower extremities, accompanied by forcible and spasmodic flexion of the legs or thighs.

There were also clonic contractions of the lower extremities; sensibility still present.

16th. Rigors and spasms of the legs; general increase in the extent and violence of the contractions and rigidity.

Dec. 29. Patient died after falling into a condition characterized by general decline. Her consciousness was preserved throughout until within an hour of her death.

The autopsy revealed heart vegetations, the remains of an old patch of softening in the left corpus striatum, and meningo-myelitis with decided sclerosis of the lateral columns of the cord.

¹ Gaz. Méd. de Paris, 1869.

Here was a case in which the violence of a general inflammatory disease was shown almost entirely in its effects upon these limited portions of the cord, the only indication of the invasion of other regions being the bedsores, and deep pains which, however, might have resulted from irritation of the posterior roots.

A case of this kind has fallen under my own observation, the main clinical features being contracture of both the arms and legs, but more especially the latter, which were drawn up in extreme flexion, *generally* atrophied while the reflexes were marked.

After death a meningo-myelitis was found, the most interesting and advanced pathological changes being seen in the lateral columns, from the periphery of the cord to the outer border of the *processus reticulares*.

An account of the gross and microscopical appearances of this case will be found under the head of "Morbid Anatomy."

By far the most interesting cases of secondary degeneration from outside causes are found in the isolated cases of pure lateral column disturbance, which result from vertebral disease.

Such a case is that of Sarah McGiven, aged 13. She is said to have received an injury during infancy, from which there followed vertebral disease. As a result, a double lateral curvature (kypho-scoliosis) has taken place, and the deformity is quite conspicuous. The dorsal vertebræ are very prominent, and the posterior-spinous process of the ninth is especially so.

She presents as symptoms, paresis of both lower extremities, but more especially the left. The tendon-reflex is easily aroused. Passive flexion causes rigidity, and extension seems to have no effect one way or the other. The reflex action of the skin is slightly impaired, but not enough so to be pathological. Her upper extremities seem to be unaffected; *no anæsthesia* whatever; goes regularly to the stool, and urinates without difficulty. When she stands there is some awkwardness, and reaction of both heels, while she walks with the "spasticher gang." There are no head symptoms whatever; intelligence is good. Her paralytic and other symptoms have progressed slowly, and are probably due to gradual pressure upon the lateral tracts.

It should be remembered that there was no dissecting or excessive general atrophy.

Of Seguin's cases, Nos. I., II., III., and V., presented histories, which varied but slightly, and all presented, as their probable origin, some form of vertebral disease.

In Case I. there was an angular curvature from a projection of the spinous processes of the fifth and sixth dorsal vertebræ. In Case II. there was injury to the back three years before—traumatic Pott's disease. In Case III. "incipient Pott's disease"—compression at the upper cervical enlargement. In Case V. decided angular curvature at a level with the third and fourth dorsal vertebræ.

Ollivier's¹ case, in which recovery took place, and a swelling in the dorsal region appeared and afterwards subsided, is one instructive illustration of this form of disease with sudden onset.

CASE.—*Caries of first dorsal vertebra, complete paralysis, contractions of inferior members, incomplete paralysis of sensibility; and retained voluntary control over the bladder and rectum.*

H. P. L., aged 21. Bodily functions generally in a normal state. He became suddenly paralyzed one month after admission to the hospital, and remained so for some time. There succeeded a general spastic flexion of the lower extremities. His thighs are flexed on the pelvis, and can with difficulty be extended. *Sometimes, however, the extension is easy*, but is always followed by reaction. He cannot govern his legs to any great degree. There is a slight disturbance of sensibility (engourdissement) and some *trembling* which can be produced by pressure on the nerve trunk.² Bladder and rectum entirely unaffected. Respiration has been slightly impaired, and patient's breathings were more rapid than they should be. A slight tumor was observed of the size of a pigeon's egg in the lumbar region, and there were fluctuation and heat; and when a few months afterwards it was opened the patient improved.

VI.

ETIOLOGY.

The cause of disease of the lateral columns is but little known if we may put out of the question such mechanical factors as external disease or pressure, such as are found in secondary degeneration.

A reference to some of the forms of trouble spoken of in other

¹ Op. cit., tome i. p. 368.

² This coincides with modern investigations.

pages is all that may be necessary under this head. (I allude to the hysterical and infantile forms.) In the first I think there can be no doubt as to the origin of the affection as its name implies; while in the other are actual cavities in the cord, secondly, degeneration with syringomyelia or non-closure of the central canal; or imperfect formation of the lateral columns may be the local cause of the disease.

In such cases as the latter there seem to be no hereditary influences except, perhaps, consanguineous marriages; and we are in about the same extremity when we attempt to trace back influences of this kind in cases of cleft-palate, harelip, and congenital deformities of other kinds.

In one of Erb's cases, occurring in infancy, the fact that five other children in the same family were born before full term, is suggestive of a tendency to non-development. In Richter's four adult cases there was a history of insanity on the father's side in two cases, and sclerosis in a third.

An infantile case is reported by Berger in which the disease followed an attack of diphtheria; but this is the only infantile or adult case in which I can find such a complication, except that which I report under the head of primary degeneration, this man having in early life had scarlet fever which was the beginning of his trouble.

Age.—The lateral columns of the spinal cord are rarely the seat of primary disease until after the twentieth year, although Erb has reported the disease in a girl of sixteen. In hysterical cases, even, the primary paresis and contractures rarely appear before several years of hysterical paralysis have passed. In my case, which has been detailed, the disease was established at twenty-two; and in none of Charcot's cases did the affection appear before adult life.

In secondary disease there is no regularity in the question of age. I think in the extra-spinal form, childhood is the period when we may expect the causation of such trouble; while if there be tumors, effusions of blood or meningeal disease, there can be no influence referable to age.

The ages of all the patients with primary disease (spasmodic tabes), whose histories I can gain access to, are the following:—

Between 15 and 20	.	.	2	Between 40 and 50	.	.	9
" 20 " 30	.	.	8	" 50 " 60	.	.	3
" 30 " 40	.	.	15				—
							37

As to the occupation of these patients:—

3 were laborers,	1 was a shoemaker,
2 “ peasants,	1 “ painter,
2 “ tradesmen,	1 “ printer,
1 was a barber,	1 “ butcher,
1 “ teacher,	1 “ carpenter,
1 “ car driver,	1 “ clerk,
1 “ silversmith,	

and in twenty cases the occupation was not stated.

Of these patients, twenty-four were men and thirteen women. In fact, the disease is not so common among women, and in many of the cases there was an hysterical element, notably so in the case of the Princess F., reported by Erb. In his article, in “Ziemssen,” he refers to the fact that the disproportion is not so great as in locomotor ataxia.

Climatic influence has been alluded to; in fact, the singular circumstance that a number of Erb's cases were from Rhenish Bavaria led him to think that there was some endemic influence; but the subsequent recognition of cases in all parts of the world proves the contrary.

Bétous and myself have had cases in which the patients were metal workers; but, at least in one of these cases, there were other causes; so this theory must fall to the ground. Syphilis has not entered into the history of the cases; and Erb does not think it has much influence in the production of the disease. “Damp, humid, cold,” in the experience of Charcot, who has seen five cases, has been found to play the part of an exciting cause; and in many of the cases above detailed, exposure to rain, excessive venery, or dissipation have had something to do with the development of the disease. So little is known in regard to the genesis of all forms of sclerosis, that any attempt to solve the problem must be speculative. I do believe that locomotor ataxia (and probably the disease in question) is undoubtedly due to what is at first but an ischæmic spinal state. In certain individuals of sedentary habits and nervous temperament, occasionally the victims of the gouty vice, the cord is subject to sudden modifications in circulation, and consequently in nourishment, and as a result a condition of “spinal irritation” in the primary trouble, which may depend upon anæmia, on the one hand, or unequal congestion on the other; and, as a result of such changes, a hypertrophy of the connective tissue which constitutes the sclerosis; and as sclerosis of nerve tissues has its analogue in

cirrhosis, on the one hand, or fibrous phthisis on the other, we must study the pathological and etiological bearings of these diseases for processes which are, to some extent, parallel.

In another set of cases (and among them may be included the secondary degenerations of local origin) traumatism plays a very important part, and, according to Berger, one which is quite common.

Mental troubles or anxiety may predispose to the disease, or accelerate its unfavorable progress should it exist.

In secondary cases we are to look for previous spinal or vertebral diseases; and, finally, we are to inquire in regard to syphilis, although, as I have said, Erb does not attach much importance to its etiological importance.

VII.

PATHOLOGY AND MORBID ANATOMY.

The proper consideration of this subject necessitates a brief allusion to the development of this portion of the spinal cord, more especially in relation to the explanation of what may with propriety be considered to be the origin of the infantile form already alluded to.

The earliest indication of the spinal cord is at about the end of the fifth week, when after treating the foetal cord with alcohol, it is possible to find two lateral fillets. Tiedeman discovered that a week later, the cord underwent very decided changes as it increased in length and size, and at about this time the two lateral halves approximated gradually from below upwards, and a posterior fissure was formed which opened into a very large central canal.

The cord so far does not contain any gray matter; but according to Carus and the older writers, a deposit takes place inside of this cavity, and gradually narrows its calibre.¹

At the end of the third month the cord is still open at its upper part, but at the end of the fourth month very material changes take place, the cord becoming larger at places corresponding with the cervical and lumbar enlargements. Two lateral canals may be seen, one in each lateral half; and mean-

¹ The central myeline of modern writers.

while the cord becomes longer and extends much farther down into the vertebral canal.

At the end of the sixth month a splitting up of fibres of the anterior and posterior columns may be observed. The central canal next diminishes greatly in size until at the end of the eighth month, when it is scarcely perceptible, except in the cervical region.

In regard to the special development of the lateral columns, we may refer to Pierret and Charcot:¹—

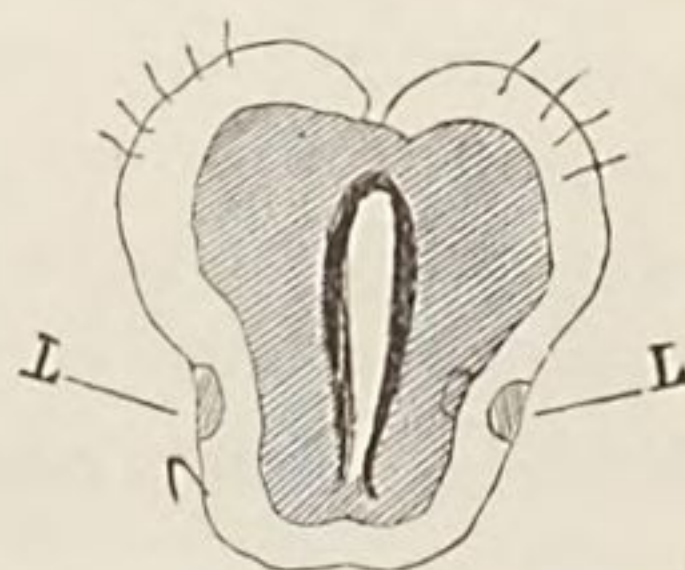
“As soon as the central fissure is closed posteriorly, the embryonic mass tends to separate by the formation of a lateral or transverse extension of the central canal, so that the appearance of the anterior and posterior tract in each lateral half remains. The rudimentary parts which afterwards become the anterior and posterior horns of the gray substance are next perceived; and at the end of the first month the white substance is formed which is in connection with the nerve roots. These tracts have been called by Pierret respectively the anterior root zones, which form a good part of the antero-lateral columns; and the posterior root zones, which latter become the posterior columns and include the columns of Goll.”

It is not until the end of the sixth or eighth week that any appearance of the lateral columns is to be recognized, but at this time two little tubercles are to be found (Fig. 8). The columns of Tuerck and Goll appear at the end of the eighth week.

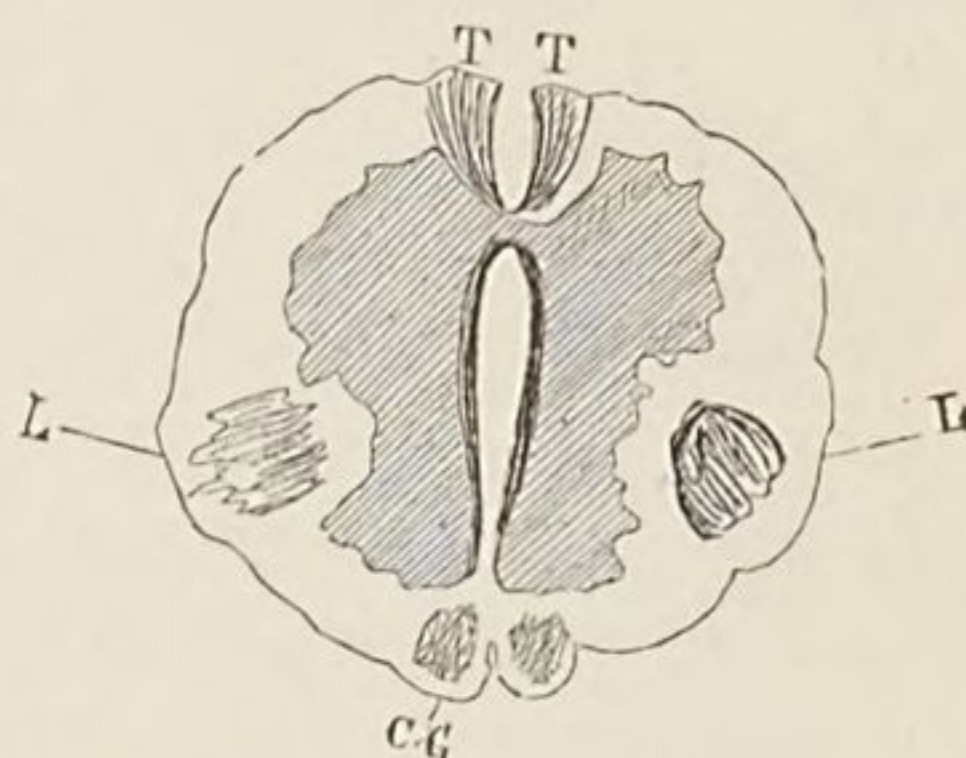
These lateral columns afterwards

Fig. 8.

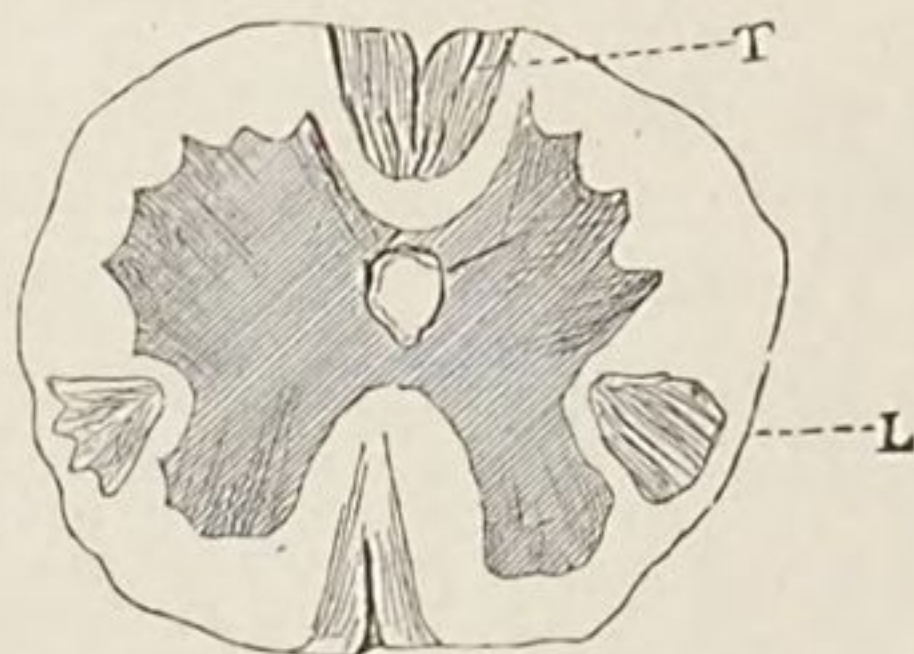
6 weeks.



2 months.



12 to 15 weeks.



Development of Human Spinal Cord
(Charcot).

¹ Leçons sur les Malad. du Syst. N. 1 f. 1873, p. 215.

become intimately related with the anterior and posterior root nerve fibres. Fleischig and Charcot have noticed that the nerve tubes in the foetus containing myeline are rare, and that connective tissue is a conspicuous element, and these parts may be tinted strongly by carmine, and partly by osmic acid; and even in the normal state the nerve cells present a certain fatty granular appearance which, according to Charcot and Parrot has been called the "Steatose physiologique."

In the child's cord Kölliker and Charcot have observed a fissure more or less pronounced at the periphery which marks out the dividing line between the lateral and anterior columns. Bearing these facts in mind, it may be taken for granted that the human spinal cord may be the seat of numerous errors of development which consist sometimes in an interruption or anomaly in the formation of the lateral columns; and as a result, various cavities in various parts of the cord may result.

The older writers have observed lateral canals. Carus found a case of this kind. Longet, Ollivier, and Goll have reported the existence of such lateral openings, and other writers have detailed post-mortem examinations which revealed the existence not only of a dilated central canal, but two lateral cavities as well. Calmeil describes two lateral canals in the cord of a lunatic; and other cases may be found in the writings of Cloquet, Meckel, Wymann, and Morgagni.

In these cases the absence of tissue is either probably due to a form of congenital arrest of development which is known as *hydromyelia*, and may exist in the form better known as "spina bifida," or there may be cavities formed in the cord as the result of disease, which have received the name of *syringomyelia*.

On the other hand there may be a sclerosis of the cord before birth. In either of these conditions the child may present the symptoms of congenital trouble such as we have already considered.

The existence of openings has usually so far been recognized in the posterior columns; and the reader is referred to an exceedingly interesting article by Leyden,¹ in which a number of such cases are presented as the result of an early myelitis.

Under this same head belong the cases of dilatation of the central canal either as a result of disease or non-closure of the

¹ Virchow's Archiv, Bd. 68. Oct. 9, 1876.

original fissure; but these do not come directly within the scope of this essay.

In Leyden's cases the cavities which were the result of disease were characterized by great unevenness of contour by splitting up of the opening into others, or by certain indefinite and irregular variations, while the canals due to the absence of tissue incident to arrest of development were of symmetrical configuration; and the cord rarely presented any evidence of general disease, such for instance as sclerosis.

As to the arrest of development of the cord and the consequent abnormality in the lateral column function, we must take into account the fact of the existence of the transverse fissure alluded to by Charcot and others, among them Waldeyer,¹ who in

an article upon the subject, presents some plates. Fig. 8, in his article represents the crucial shaped appearance presented by the central fissure at a very early period; and it is quite probable that the two lateral arms, or cavities *a, a*, may remain permanently open in some of the cases of this infantile form of disease soon after its antero-posterior branch has closed.

This theory of imperfection of the lateral columns as a pathological explanation, is borne out to some extent by an autopsy made by Schultze² in the case of a child two years and three months old, who died of hydrocephalus, the symptoms appearing at the third month. The entire lateral columns and in some degree the anterior columns were found to be the seat of degeneration, while the posterior columns and the gray matter of the

Fig. 9.



Fig. 10.

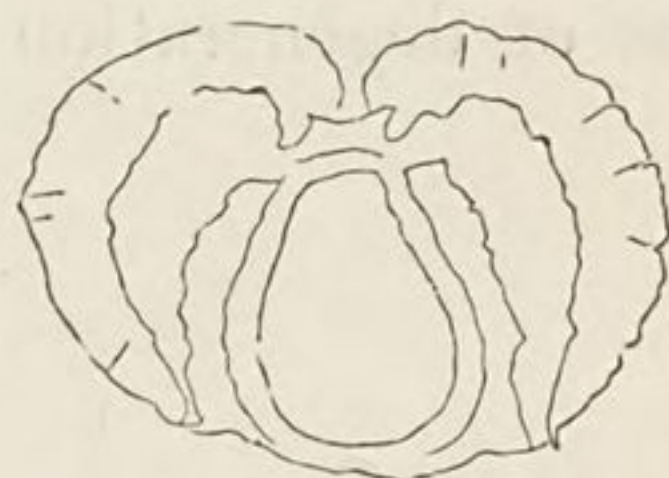
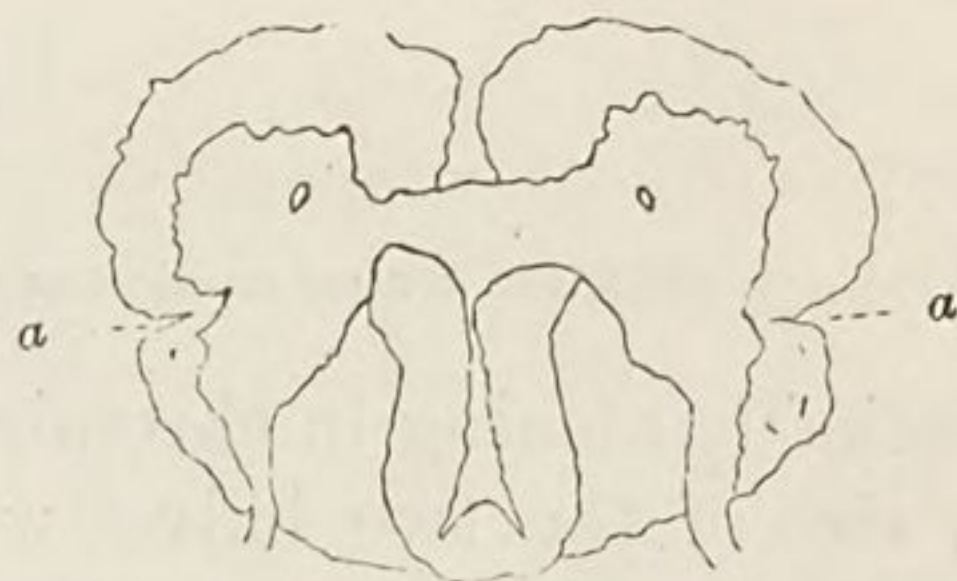


Fig. 11.



9. 10. Mydromyelia.

11. "

11. *a, a*. Lateral fissures, imperfect development of lateral columns. (Leyden.)

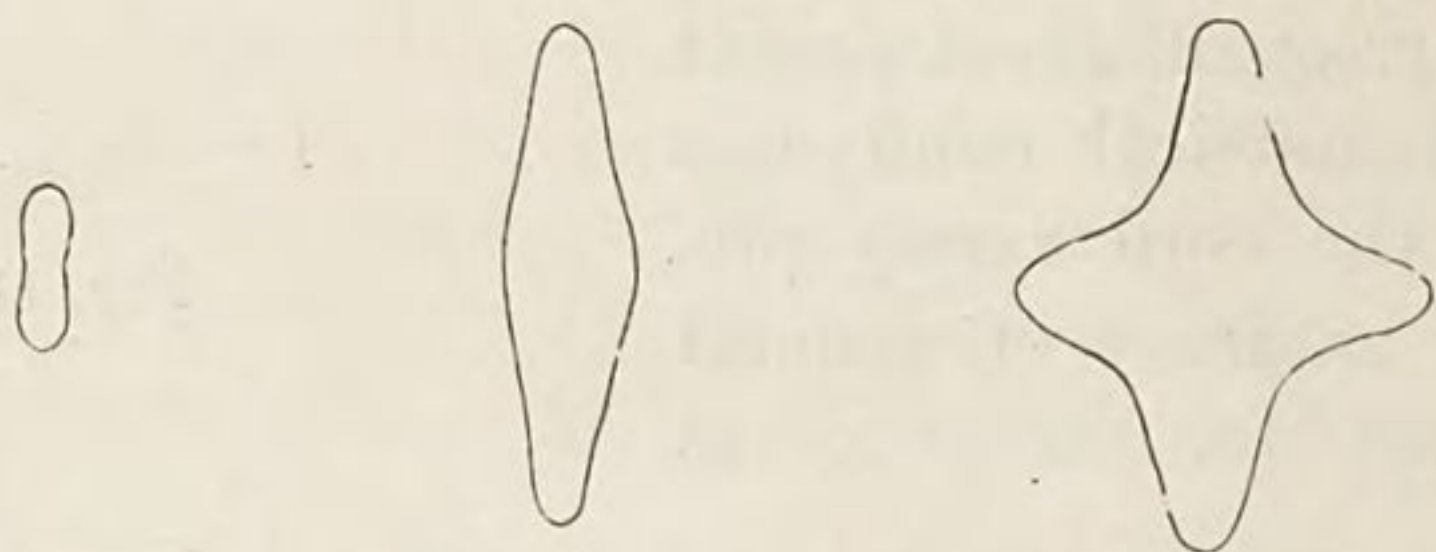
¹ *Über Entwicklung der centralen Kanäle im Rückenmark.* Virchow's Arch. Bd. 68, H. 1, Oct. 9, 1876, p. 20.

² *Centralblatt für die Med. Wiss.,* 1876, No. 10.

anterior columns were normal; and he found the development of the motor tract imperfect.

In a case of congenital club-foot, disease of the lateral columns was found. Dejerine¹ reports the case of a man 40 years of age, who died of empyema. The patient was afflicted with talipes equinus of congenital origin, the right foot being involved. The muscles of the anterior part of the leg were diminished in volume, were pale and flabby, and presented evidences of degeneration of muscular fibre. The cord after six

Fig. 12.



Shape of central canal at an early period of foetal life. (Waldeyer.)

weeks' hardening in chromic acid was examined and a difference in size of the two halves was perceived in the lumbar region, the right side being smaller; and there was extensive atrophy of the left lateral column, as well as less marked atrophy of the other column, and the anterior cornua. The anterior roots were atrophied and yellow, but no change had taken place in the posterior columns. The vessels were thickened while externally the antero-lateral columns were sclerosed, and the seat of a dense fibrous network, with almost complete disappearance of the tubes.

The last case, then, presents the possibility of limited disease of the motor tract beginning at a time before birth.

What are the pathological conditions which give rise to increased reflex, loss of power and contractures?

Brown-Séquard,² several years ago, demonstrated that section of the lateral columns would be followed by paralysis of voluntary movements, but this loss is by him supposed to occur only when the section is made in the upper part of the cord.

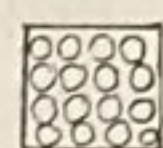
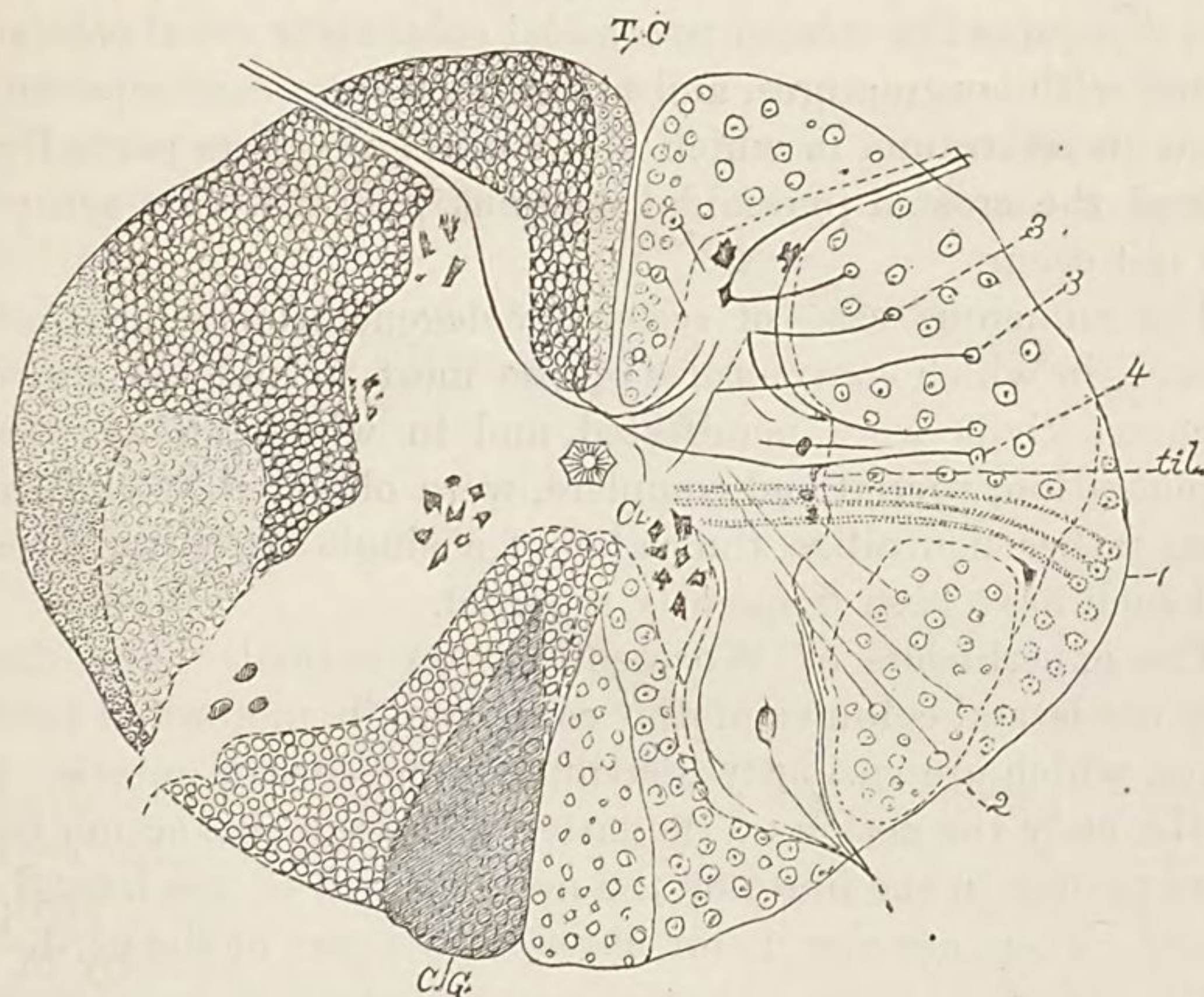
Subsequent investigation by others in the field of neurology proves, however, that a section at any point in their course will be followed by more or less loss of voluntary power.

¹ Archiv. de Phys. Norm. et Path., No. 2, 1875, p. 253.

² Central Nerv. Syst., p. 121.

Fleischig,¹ in an elaborate article, has written extensively upon the connection of certain fibres in the lateral columns, with cells in the anterior gray horn and Clarke's columns; and

Fig. 13.



Fibres of posterior columns.



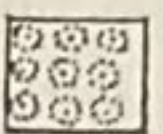
" columns of Goll.



" antero-lateral columns.



" crossed pyramidal columns and columns of Türek.



" direct cerebellar columns.

1. Fibres from direct cerebellar columns to region of Clarke's columns. 2. Fibres from crossed pyramidal columns to central gray matter. 3, 3. Fibres from antero-lateral columns to anterior gray horns. 4. Fibres from antero-lateral columns to cells in tractus intermedio-lateralis. *CG.* Columns of Goll. *CL.* Clarke's columns. *TC.* Türek's columns.

Vide Archiv der Heilkunde, H. 2, 1877, p. 101.

certain fibres of the crossed pyramidal columns evidently arise from large cells in the anterior parts of the anterior horns; and

¹ Archiv der Heilkunde, 1877-1878.

these are supposed by him to be concerned in the innervation of peripheral motor power. Fig. 13 will enable the reader more fully to study his arrangement.

Gray,¹ in a very readable article, says that he is not prepared to accept Fleischig's views in their entirety, because he believes that disease of the crossed pyramidal columns is not always associated with contractures, and brings forward a case reported by Shaw in refutation, in which the morbid processes partially involved the crossed pyramidal columns, and still this symptom did not occur.

The numerous cases of secondary degeneration after cerebral disease, in which contractures of the most formidable and conspicuous kinds were manifested, and in which all degrees of degeneration, partial and complete, were observed, would, however, rather neutralize the value of a single exceptional case; and such have been frequently reported.

The experiments of Woroschiloff² on animals have shown that the lateral columns of the cord contain motor and sensory fibres, which are variously distributed, and for the anterior part of the body the action of the latter is crossed, this action being more perfect in the fibres of the middle third of the lateral columns. There are also motor fibres in this part of the cord.

His experiments show that irritation of the peripheral sensory nerves of the limb of the animal in *front* of the lesion of the cord, produces only reflex movements in the limb on one side, which is wholly or in part uninjured. If, however, this part of the lateral columns was destroyed, it was impossible to cause reflex movements in the hind limb, even when excitation of the anterior part of the body was severe.

It was found that if the anterior half of the lateral columns was not intact, no reflex movements could possibly be induced. Electrical excitation of the cervical cords "caused repeated alternate flexion or extension, or tetanic contraction of the limbs." The first would not follow if the middle third of the lateral column was not intact; the tonic contractions took place even when the corresponding lateral column was destroyed.

In regard to the production of the tendon reflex, Schulz³ and

¹ Loc. cit. p. 174.

² Ludwig's Arbeiter, 1875. Abstract in Journal of Nervous and Mental Diseases, 1876.

³ Centralblatt f. d. Med. Wiss., No. 54, 1875.

Tuerbinger have experimented by dividing the cords of rabbits, and exposing the tendons. They have come to the conclusion that the phenomena of tendon-reflex are not those which result from a local excitation through muscles, nor that such movements are skin reflexes, but that there is a local irritation of certain nerves described by Sachs,¹ which have terminal filaments in the tendons.

We are also reminded by Erb,² that the tendon-reflex occurs even when the tendon is tapped in situations where there is underlying bone, and where there is no possibility of jar or mechanical irritation of the attached muscles. The tendon can even be pinched when held in the fingers and in a relaxed condition, and the contraction will follow.

To do away with the possibility of cutaneous irritation, the skin may be anæsthetized by the local spray, and the same thing then occurs.

In some of Erb's cases, the tendon reflex could be excited by pressure over one of the lumbar vertebræ, or over other bony prominences; but in this case there was no secondary reflex. In examples where irritation of the skin gives rise to the tendinous movement, the same are likewise secondary; and this was the case in the third case detailed on a preceding page, under the head of primary degeneration of the lateral columns.

It has also been found that pressure on the central nerve will diminish, if not stop, the various expressions of heightened reflex in the lower extremities.

The different phenomena of the tendinous reflex depend upon the integrity not only of sensory nerves, but the paths of sensory condition in the posterior columns; and Henze³ observes that in certain hemiplegiæ connected with hemi-anæsthesia, the probable failure in producing the tendinous and other reflexes depends not so much upon the paresis of the muscle, as upon the insensibility of the integument, or the nerves of the sinews.

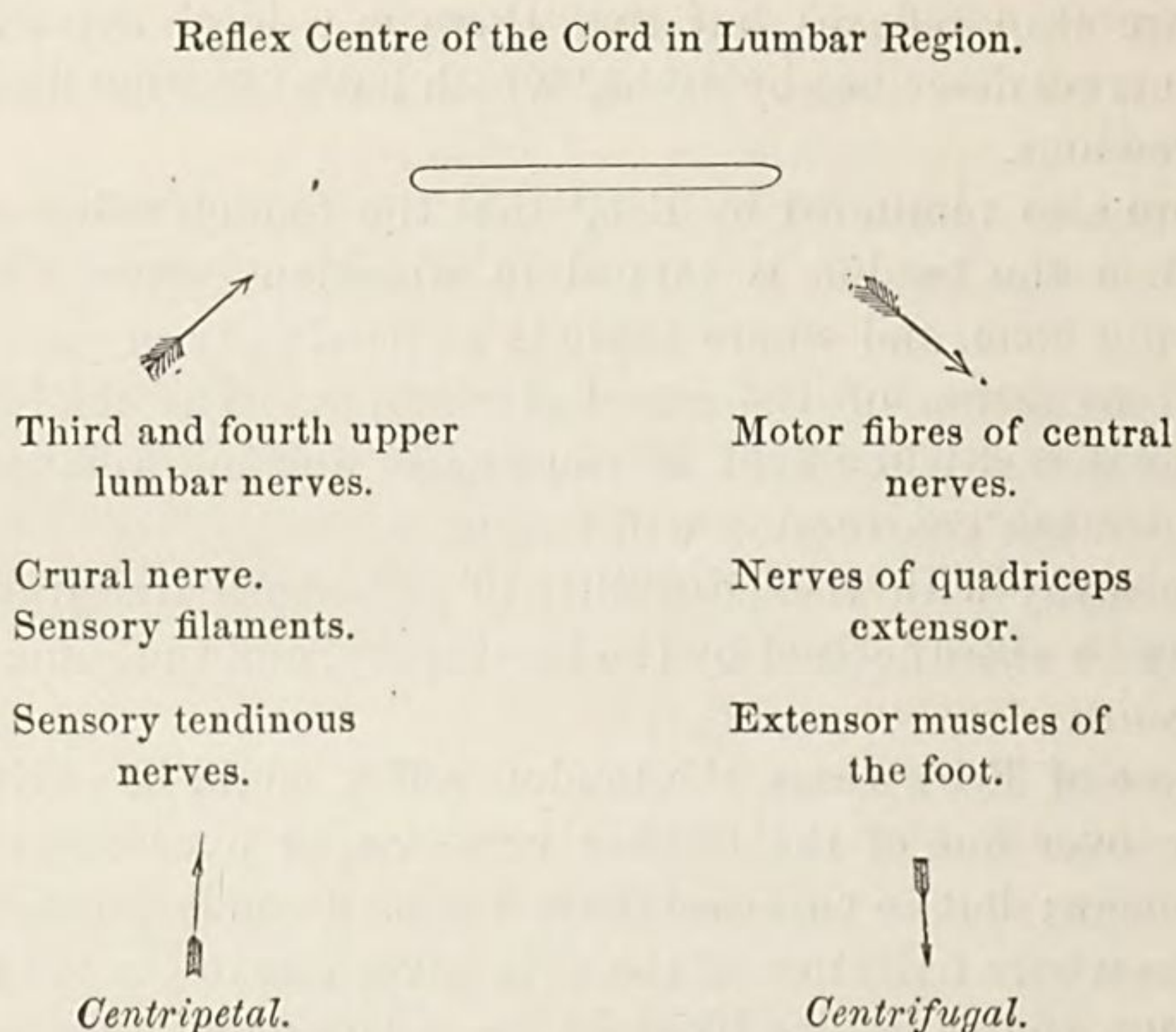
The experiments with local anæsthesia have shown, however, that cutaneous sensibility may be blunted, and still the tendinous reflex may be excited; so I am disposed to accept the view that in some of these cases where there is no profound paresis of the muscle, the non-excitation of the reflex can only depend upon a certain anæsthesia of the tendinous nerves.

¹ Rerchert and DuBois Raymond's Archiv, iv., 1875, p. 402.

² Ziemssen's Cyclop., vol. xiii. p. 49.

³ St. Petersburg Med.-Wochenschrift, No. 35, Oct. 30, 1876.

According to this author, the probable route which the peripheral tendinous excitation and the reflex movements in the lower extremities take is the following:—



The *central* conditions which enter into the production of exaggerated states of the tendinous reflex, and the group of reflex disorders of motility are

1st. A condition of irritation or inflammation of the central gray substance ;

2d. A suspension of inhibition.¹

In this case the lesions involve the strands of nervous conducting matter concerned in the transmission of cerebral or local inhibition.

In the diseases under discussion, it would appear that the last of these is that which enters into the pathology of disease of the lateral columns ; for in the majority of cases the gray matter is intact.

The careful investigations of Fleischig,² already referred to,

¹ In regard to the suspension of cerebral inhibition, I think we may make use of the hysterical cases of lateral column degeneration to explain how an inveterate voluntary paralysis such as occurs in hysteria may by a continuous arrest of inhibitory action of the central variety lead to a degeneration of parts concerned in the transmission of ordinary voluntary impressions.

² Loc. cit.

demonstrate that certain fibres in the lateral columns are connected with certain cells in the anterior cornua and other parts; and that in disease affecting this part of the cord, the spinal inhibitory action which is acknowledged by nearly all neurophysiologists, among them Erb,¹ Brunton,² and others, to enter into the production of certain motor impulses of spinal origin; is suspended.

Allusion has been made, in speaking of symptomatology, to the fact that an original excitation of a tendon was often followed by a series of muscular contractions.

This has been noticed by Freusberg; and according to Pflüger³ it is explained by the theory that the original excitation is transferred from a sensory to a motor fibre on the same side of the cord; then by others on the other side; thence back, following a zigzag course and giving rise to unequal muscular motorial innervation. (See Appendix.)

The *contractures* which occur are due to a tonic rigidity of the flexors, and are rarely, if ever, attended by any change of substance or tissue but are due to an irritation of central nervous tracts.

The *spastic gait* is a result of reflex contraction of the muscle, dependent upon retraction of the tendons; and with this a certain paresis.

The *early sensory disturbances* are due probably to irritation of the posterior nerve roots; and as a consequence the dragging neuralgic pains and burning.

THE GROSS APPEARANCES OF DISEASE OF THE LATERAL COLUMNS present many variations; and markedly differ in regard to situation and degree of degeneration. It is unusual to find absolute non-involvement of the other columns of the cord, as in the case observed by Westphal, and alluded to by Erb. The posterior columns are liable to be affected to some extent; and this complication affects but very slightly the clinical features of the disease; while if there be involvement of the anterior columns the conspicuous atrophy will give to the disease picture a very different aspect.

This condition of affairs was witnessed in a case of anomalous progressive atrophy brought forward recently by Shaw,⁴ and

¹ Cyclopædia of Practical Med., vol. iii.

² West Riding Reports, vol. iv.

³ Quoted by Erb.

⁴ Journal of Mental and Nervous Diseases, January, 1879.

there are additional cases of this character reported by French authors.

So far, no autopsies have been made which have revealed uncomplicated disease.

In a case which has been diagnosed by Charcot¹ to be one of pure "Tabes dorsalis spasmodique," the disease of the cord came more properly under the head of disseminated sclerosis than local degeneration. This case is mentioned in Bétou's thesis.

Ollivier gives autopsical results, but these are too indefinitely detailed, and too inexact to be of much service. The cases, however, which are of greatest interest to us are those in which there has been secondary disease.

It has been assumed by Charcot, and in some of his hysterical cases it has been found, that the form of degeneration known as "primary" occupies a wedge-shaped area beginning at the periphery of the cord, and extending through both the cerebellar and crossed pyramidal columns.

In one of his cases² the sclerosis was found to involve the entire length of both lateral columns, while other parts were perfectly healthy. There was no trace of meningitis, and the character of the semi-gelatinous, grayish deposit, was unmistakably sclerosis. The microscope revealed atrophy and disappearance of nerve tubes with annular constrictions. The gray matter was intact, and the cells unaffected. There was increase of the connective tissue, and an abundant deposit of amyloid cells. Upon making transverse sections, these appearances will be best shown.

In the descending secondary degeneration consecutive to cerebral disease, the lesion will be found on one side only, and the crossed pyramidal fibres will be alone affected; while if this descending form be seen as a result of spinal disease, the lesion will be bilateral and may involve other parts as well in the lateral columns at a different plane.

An ascending lesion, according to Erb,³ Pitres,⁴ and others, is usually characterized by degeneration of a narrow peripheral border of tissue confined to the cortex and extending forwards somewhat as far as the anterior nerve root tracts.

I have already sufficiently alluded to the anomalies in devel-

¹ Leçons, etc., 1878, p. 294.

² Gaz. Hebdom. No. 7, 1865, p. 109.

³ Ziemssen, vol. xiii. p. 773.

⁴ Gaz. Méd. de Paris, 1877.

opment of the cord, and the destruction of certain parts by disease before birth. Under this class comes the case detailed by Schultze,¹ in which with hydrocephalus there was congenital non-development of the spinal motor tracts and myelitis.

Should the degeneration follow Pott's disease, Leyden² is of the opinion that it begins at the point of compression and extends downwards, although Michaud has found in some cases of slow compression that the myelitis ascends in these columns.

Should the cortex be involved primarily, and be the seat of a myelitis, it will be found that there is a thickening of the neuroglia from the periphery to the centre, just as in the primary scleroses.

According to Lange,³ softening is a common form of degeneration, and the fibres of connective tissue are not uniformly thickened, but such increase of volume is observed here and there in the midst of the diseased mass, and irregularly shaped nuclei will be found attached to their sides.

In such cases of secondary degeneration, should there be a meningo-myelitis, the appearance seen in Voisin's case and my own will be displayed. In the former, the history of which has been alluded to on a preceding page, the spinal cord was not found atrophied, and the state of the anterior gray matter and posterior columns was normal. There was opacity of the meninges, especially posteriorly where the surfaces of the arachnoid were found to be of an opaque white color. This membrane and the pia mater were found to be the seat of deposits of cellular and other new formations; and there were points of attachment and adhesion between the opposed surfaces of the arachnoid.

A transverse section made at the level of the first dorsal vertebra, revealed a different condition, with a yellowish redness of the anterior columns which extended three centimetres below, and was notably more marked on the right side. At a point, three or four centimetres below the first dorsal vertebra, both lateral columns present externally a grayish-yellow hue, a gelatinous appearance, and they are evidently diminished in size. This tint extended as far down as the chorda equina, and equally on both sides. No appearances of disease were perceived

¹ Centralblatt f. d. Med. Wiss. 1876, No. 10.

² Klinik der Rückenmarks Krankheiten, Erste Band.

³ Abst. in Schmidt's Jahresbericht, 168, 1875, p. 238.

in the chorda equina. Section of the cord at different levels revealed the same coloration corresponding to the external appearance; and the lateral columns only were involved.

On the left side the lesion was more extensive than on the right, and advanced as far internally as the central gray substance, and extended from one to one and a half millimetres, forming a little triangle, the base being directed to the periphery of the cord. The sides of the triangle were not regular. On the right side the lesion is less exactly limited. The cervical portion of the cord, bulb, cerebral meninges, and other parts were quite normal; but an old cicatrix of an ochre tint, two centimetres in length, and eight millimetres in breadth, was found in the left extra-ventricular nucleus on the left side.

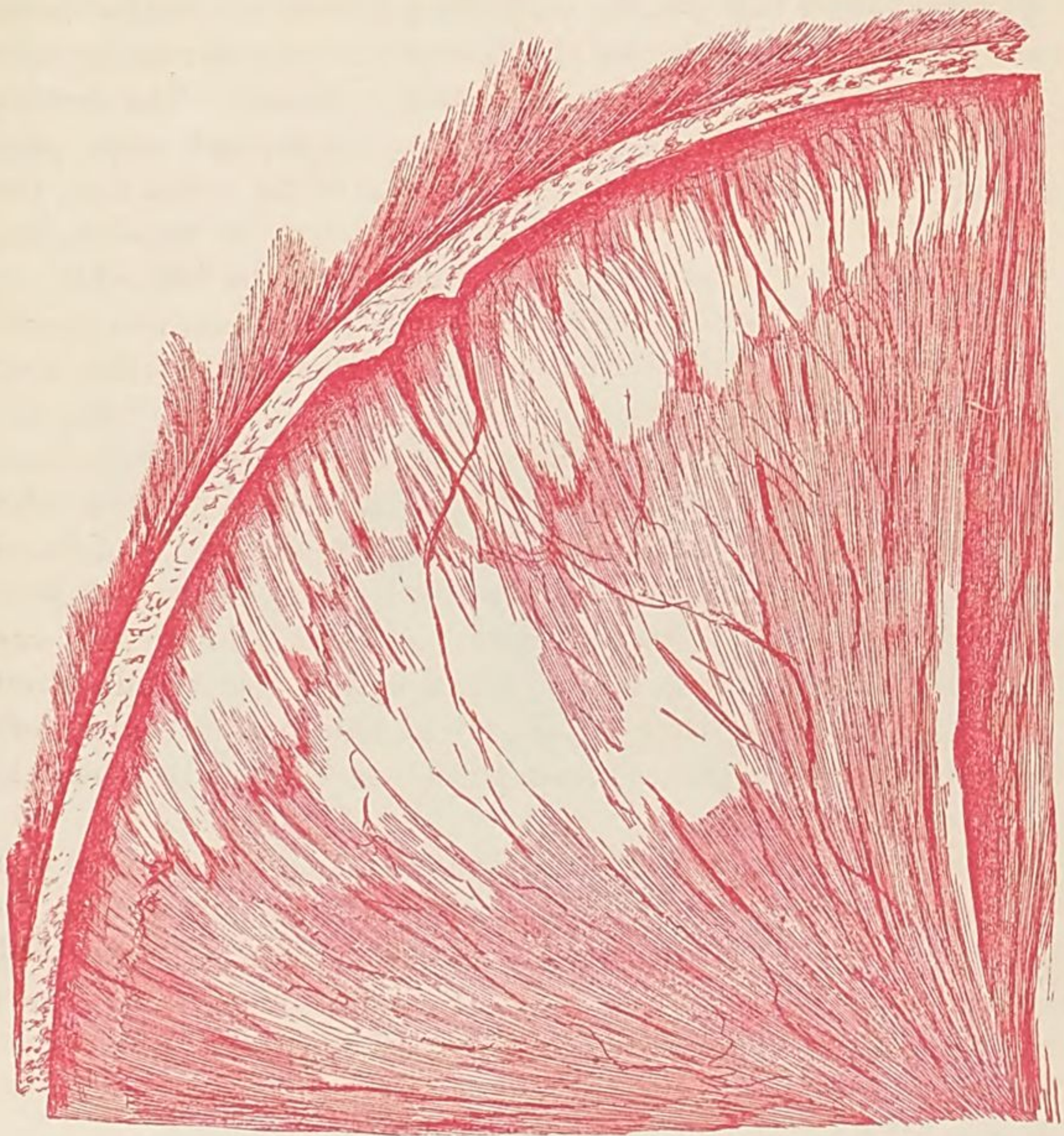
The condition of the lateral columns was examined microscopically by Liouville, both in a fresh and hardened state; and, in the former, the vessels were found to be increased in size, their walls studded with fat granules, and abundant nuclei; and the connective tissue was opaque. In the place of nerve tubes and cells were found masses of very fine fibrous tissue, and many amyloid bodies. After maceration for a month in a weak solution of chromic acid, sections were made and colored with carmine. Sclerosis of the lateral columns was discovered, which was more extensive than on the right side, and the gray substance was found separated from the diseased tissue by a healthy tract of nerve tissue.

In a discussion upon this case Charcot was of the opinion that the meningitis was consecutive to the sclerosis; but from the history of the case I do not think that this is a warrantable conclusion; but in the absence of any special mention in regard to the thickening of the neuroglia of other parts of the cortex, we are obliged to accept his theory, at least in this particular instance.

In my own case, that of a girl in whom there had been meningo-myelitis for some years, the following appearances were noted, autopsy made twelve hours after death.

Thighs flexed and rigidly adducted. No abnormal appearances witnessed in the brain.

Spinal Cord.—In cervical region adhesion between dura mater and wall of spinal canal; also same at another point in the dorsal region, adhesions between opposed surfaces of arachnoid in cervical region quite firm and general on the posterior surfaces.



Left lateral column (sclerosis). 2 in. objective. (Amplified by camera.) Vide p. 1010.

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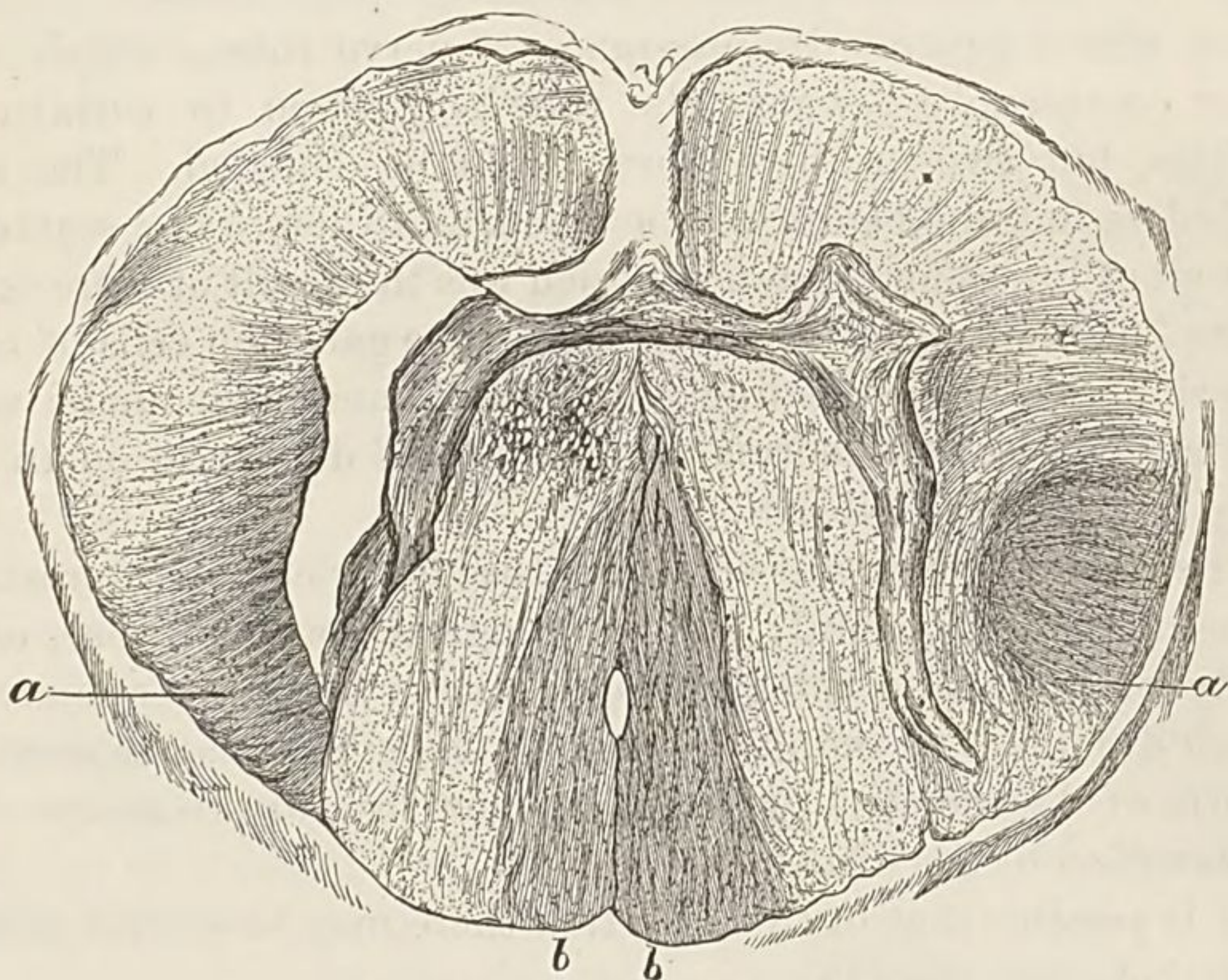
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Adhesions of lesser degree at other parts. Veins of cord were filled. Nearly all portions of dorsal cord soft to the feel. Throughout cervical region, where the dura and other membranes were most affected, the right lateral columns were to the feel firm, and had a bluish-gray color with yellowish streaks. Lumbar region to gross appearance showed no abnormality. In dorsal region, posterior longitudinal fissure was obliterated by adhesion of the pia. A transverse section of the cord at the cervical region, under a low power, presented the appearances depicted in Fig. 14.

Fig. 14.¹

a, a. Lateral columns. *b, b.* Columns of Goll.

Microscopic examination revealed on both sides a hyperplasia of connective tissue, which was most dense at the periphery of the cord, while there was a compact network of fibres which interlaced and extended to the centre. While the thickening was perceptible in the anterior root zone, it was especially marked in the posterior part of the lateral columns. With a low power a dark triangular segment of dense connective tissue was observed extending from the periphery to the outer border

¹ The above cut was made from a photo-micrograph, and it is to be regretted that the left half of the specimen was injured by accident.

of the central gray matter, extending anteriorly to a point limited by an imaginary line drawn from the posterior group of ganglion cells in the *tractus intermedius lateralis* to the border of the cord internally (*i. e.* adjacent to the gray matter of the posterior horns) was found a reticulated arrangement of thickened fibres, the interspaces becoming smaller and the neuroglia more dense, until within a short distance of the inner fibres of the direct cerebellar column. At this part the spaces became longer and elongated, and the fibre more prominent. In the anterior part of this dense tissue were found arterioles with thickened walls surrounded by granular substance, which had been thrown out. In the spaces between the thickened connective tissue there was a general disappearance of nerve tubes, which was most conspicuous towards the periphery when in certain localities, but two or three fibres could be detected. The axis cylinders in some places were swollen, and there was a scattered deposit of granular substance, which was the result of "breaking down" of the connective-tissue cells. The ganglion cells of both anterior horns were seemingly unaffected, and their nuclei were distinct, while no abnormal appearance of degeneration in the gray matter was visible.

Microscopically it will be found that a variety of interesting appearances are general; and pathological considerations, especially of spasmodic spinal paralysis, have been the subject of much difference of opinion; Charcot believing that sclerosis is a form of degeneration, while Erb is not so ready to accept this explanation of the disease.

It is possible that in this affection there may be several grades of pathological trouble.

In Lange's¹ communication attention is directed to two graded conditions dependent upon diseased action:—

1. Simple gray coloration without any destruction of nerve tubes. With this there is a prominence of the neuroglia cells while there is an increased clearness of the nuclei. The general discoloration is darker than in the next form.

2. Sclerosis, in which the main element is increase of connective tissue, and destruction of nerve tubes.

It is probable that these two conditions are those which are to be found in cases of slow progress, while a myelitis with softening is probably not uncommon in the secondary forms.

¹ Op. cit.

The changes which begin in simple discoloration, and extend to sclerosis include a list of slow changes of a progressive character. The nerve tubes appear at first altered in calibre and become swollen; their axis cylinders also swell and there is unequal bulging of the nerve tubes, giving rise to an appearance of varicosity. Granular degeneration is probably the next step in the process; and ultimately there is shrinking of the nerve fibres and disappearance.

In secondary cases the existence of myelitis in other parts is to be observed; but the main appearance of the morbid process is to be localized. In many of these examples it is probable that the disease begun by a simple ischæmic state, in some such pathological condition as the gray discoloration of Lange.

VIII.

DIAGNOSIS.

The diagnosis of disease of the lateral columns of the spinal cord is not usually attended by many difficulties; and the group of symptoms is too conspicuous and well-marked to permit the observer of fair intelligence to err.

Loss of power without atrophy, and reflex excitability without diminished sensibility, enter into the formation of an unique train of symptoms; and unlike those of many spinal diseases, they are never separated in fully developed disease of this part of the cord.

In speaking of the infantile form I have alluded to several paralytic disorders of infancy with which it might be confounded; and since writing that chapter I have been fortunate enough to see a case of double talipes, the result of infantile paralysis which at first suggested the disease in question; but even in this case the loss of electric muscular contractility (though there was not the extensive atrophy which might have been expected), led me to make a diagnosis of that much more common form of infantile disorder, infantile paralysis.

As to the primary disease of adult life, not much is to be said. It might probably be mistaken for *transverse myelitis* in which the urinary and vesical functions are involved, and in which there are bedsores and anæsthesia. *Locomotor ataxia* cannot be

mistaken for the disease, for in certainly half, if not more, of the cases the patellar tendon reflex is absent. There are in addition the symptoms of ataxia, loss of muscular sense, anæsthesia of the tactile variety, optic nerve disease, and visceral pains. Charcot's¹ long list of differential points includes the following:—

LOCOMOTOR ATAXIA.	TABES DORSALES SPASMODIQUE.
Terebrating pains.	No constricting band, no anæsthesia.
Strabismus or ocular symptoms, vertigo, anæsthesia.	No cephalic symptoms.
Loss of sexual power.	Sexual power normal.
Incoördination, loss of ability to stand in the dark; suppleness of limbs, swinging of feet.	Rigidity of muscles; catching of toes and adduction of thighs and knees, trepidation.
The ataxic, though he cannot co-ordinate, can move his limbs.	In this disease there is loss of power and rigidity which prevents any movement whatever.

The gait in the two diseases is radically different. In *locomotor ataxia* the patient throws out his feet, coming down on his heels; while in all forms of *degeneration of the lateral columns*, as has been shown, there is a tendency to walk on the toes; the feet seem to cling to the ground, and there is adduction of the thighs.

In *disseminated sclerosis* there is usually tremor, irregular involvement of the extremities, cephalic disorders, and generally more or less ataxia.

Chronic myelitis of the anterior columns, progressive muscular atrophy, and amyotrophic lateral sclerosis, may all resemble in certain features the disease under consideration; although if atrophy is conspicuous, the diagnosis is easy enough, but occasionally an anomalous case is sufficiently puzzling to create a doubt.

I have seen a case of progressive muscular atrophy of the lower extremities which presented exaggerated reflex excitement of the tendons. There was a general trepidation which could hardly be mistaken for the unequal muscular contractions known as *vermicular tremor*; but in this case there was the difference of an inch and a half in the circumference of the thigh, and the muscles of the neck were unevenly atrophied;

¹ Loc. cit. p. 281 et seq.

while added to the features of progressive muscular atrophy there was a commencing aphonia and other bulbar symptoms.

In *adult chronic spinal paralysis* the development of the disease may be so insidious as to give rise to a reasonable suspicion as to its true nature, and should there be added thereto slow contractures of the dorsal muscles, the diagnosis will be still more puzzling. In such cases the tendon reflex will be found to be lowered or absent and the contractures which result are not those of the spastic variety, but rather of paralyzed muscles opposed to those which are not paralyzed.

The forms of secondary origin are more difficult to recognize, for complicating symptoms play a part which greatly confuses the examiner. There may be all the symptoms of unequal congestion of myelitis, or of concussion of parts other than the lateral columns, and time is required before it is possible to arrive at a conclusion.

In such cases the involvement of parts above the lesion is significant. A paraplegia of the lower extremities may exist and be connected with anæsthesia, retention and incontinence and even bedsores; but at a later period the arms may become the seat of paresis without anæsthesia, but with highly developed tendon reflex; and at this stage it is possible to find diminution of the symptoms of an inferior transverse myelitis, the anæsthesia clearing away, the function of the bowels and bladder being restored, and the gait becoming changed, while to the paresis there is added an excitement of the tendon reflex, but of course, such cases are rare. Should there be anæsthesia, the case may be supposed to be one of central myelitis.

The diagnosis of paresis and contractures is sometimes attended with difficulty; but it may be borne in mind that the paralysis is one of a *voluntary* kind; and there is no such muscular condition as exists in the paralysis resulting from disease of the anterior columns; for sensibility to electrical stimulation and consequent contractility are present. The contractures are unattended by atrophy.

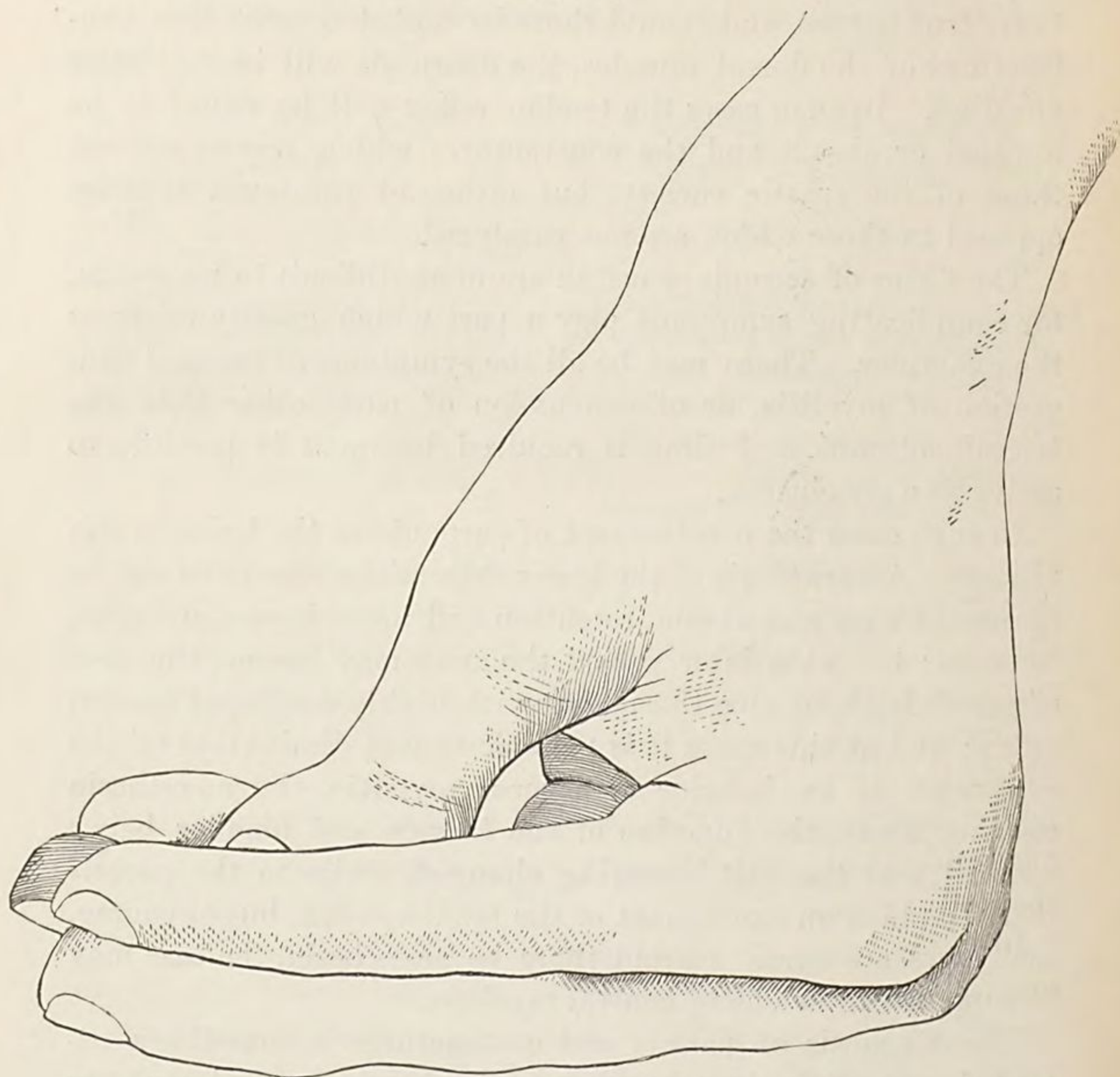
In this connection the reader is referred to an admirable article by Ferber and Gasser¹ upon certain forms of contraction of the hands and fingers.

A case is presented by them in which the patient's hand presented the deformity figured in the appended illustration:—

¹ Archiv für Psychiatrie, u Nkh. B. vii. p. 140, 1877.

A woman, thirty-nine years old, had suffered for some time from irregular menstruation; and for several years there had

Fig. 15.



Appearance of Hand in Ferber's and Gasser's Case of Hysterical Contracture (supposed lateral Sclerosis).

Vide Archiv für Psychiatrie u. Nkh. 1877, B. vii. p. 140.

been periodic contractions of the hands and fingers. Afterwards the hands became permanently contracted, there being permanent spasms of the flexors without any atrophy whatever.

The muscles contracted were the common flexors of the hands, as well as the adductors of the thumbs and interossei.

IX.

PROGNOSIS.

Infantile cases may be said to be utterly hopeless except when secondary to Pott's disease; and neither medical nor surgical treatment has so far proved of the least permanent benefit.

With cases of primary degeneration, and of the functional form, the matter is different. Erb has spoken of improvement; and the cases brought forward by Kussmaul, Berger, and others, show that the prognosis is not utterly bad, and Nixon's case of antero-lateral sclerosis (?) was greatly benefited by the remedies of which I have spoken.

Hysterical cases are always rebellious, as the central disease is the consequence of a long existing nervous condition; and not only is the psychical influence difficult to combat, but the degeneration itself is of so extensive a character that it defies successful treatment. Strange to say, secondary affections of spinal origin are not utterly beyond the reach of treatment. This is especially true in secondary degeneration or local disturbance after concussion.

Erichsen,¹ in his admirable work, alludes to certain cases in which there was quite extensive spinal trouble from railroad injury, and recovery took place. Should such concussion be unattended by laceration of nervous substance, there is some chance for improvement.

In cases following Pott's disease, in which there may be at some time loss of motion on one side and anæsthesia on the other—spinal hemiplegia of Brown-Séquard—the prognosis is especially bad, for extensive injury is indicated; but in these cases the loss of motor power is unilateral; and even they are curable.

The cases which are most amenable to treatment are of a syphilitic nature. Erb² cured six cases of paraplegia from caries; while others have been equally successful. It is a matter of doubt, however, whether this result is possible after bony ankylosis has taken place, at least such has not been my own experience.

Should there be extension upwards, as occurs sometimes in

¹ Concussion of the Spine and Nervous Shock, etc.

² Loc. cit. p. 341.

both the primary and secondary form of disease, there may be bulbar symptoms and death; while if the cervical region of the cord be the district ultimately attacked, serious pulmonary symptoms may be added to those of the disease.

It is more probable, however, that intercurrent affections, such as pneumonia or a general cachectic state, may carry off the patient.

X.

TREATMENT.

So little has been written and brought forward in regard to the influence of remedies, that not much can be said under this head.

In the favorable cases treated by Küssmaul,¹ the chloride of gold and sodium, in doses of gr. $\frac{1}{3}$ t. i. d., was used until the patient had taken gr. 90 in all. Erb places nitrate of silver at the head of the list of drugs, and at the same time recommends hydropathy.

It would seem that Nixon² also has found benefit to follow the use of the silver salt; and much improvement followed in his case under the continued administration of the following prescription:—

R.—Argenti nitratis,
Ext. nucis vomicæ, āā gr. vj.
Ext. gentianæ, q. s.
Divide in pill. No. xij.
Sig. one ter in die.

Charcot is also in favor of the nitrate of silver, and suggests in addition the application of the cautery along the spine. He has used the bromide of ammonium and sodium in large doses to diminish trepidation and spasms, and has met with excellent results.

Faradism by means of the wire brush is recommended, and galvanism (the continuous current) has been of service in Erb's hands. Strychnine is advised against when there is so much

¹ Loc. cit.

² Dublin Monthly Journal, vol. lviii. 1874, p. 207.

reflex disturbance. Thermal saline spring baths have been praised, but it has been found that internally the waters do no good.

In my own experience, I have found that the fluid extract of conium, in doses of *m.v. t. i. d.*, to be increased, is the best remedy to diminish the violence of the trepidation, while belladonna or the sulphate of atropia, in local hypodermic injections of grain $\frac{1}{48}$, is useful when there is great spastic rigidity.

As to internal remedies, I have given phosphorus, the nitrate of silver, and gold a fair trial; but am disposed to place more reliance on cod-liver oil, ergot, or some salt of mercury for the treatment of the central disease, fully believing that nutrition should be improved, and the local circulation modified—and this the ergot does.

I have found that the utmost quiet is necessary, not only for the comfort of the patient, but for the amelioration of the disease. He should be kept still, and not allowed to take fatiguing exercise; and all sources of reflex excitation should be avoided.

For the hysterical cases, however, we should pursue a different course, and endeavor to make them bring into use the muscles of the affected limb.

For cases of secondary origin, the galvanic current seems to possess great advantages; and should there be meningeal troubles, the administration of ergot is to be pushed. If the case be like one reported by Leyden, and probably rightly supposed by Erb to be of specific origin, it is necessary to give the iodide of potassium.

As in all other forms of sclerosis, it is the duty of the medical attendant to insist upon a temperate diet; and while not cutting off stimulants entirely, he should see that the patient does not drink except at meals, and then but a moderate amount of claret or one of the light dry wines. Ale, beer, and spirits are to be interdicted.

Warm climates are best suited for these cases; and a long sojourn should be insisted upon.

It is of absolute importance that all the worriments of business should be put aside, and that the mental work be of the lightest kind.

APPENDIX.

Since the preceding pages were written, an editorial has appeared in the first number of the "Archives of Medicine," in which Dr. Seguin is disposed to agree with Leyden, Westphal, and Rickelin that the supposed primary variety of disease is not invariably connected with degeneration of the lateral columns, but that it is usually dorsal myelitis(?). He admits (very reluctantly): "There is possibly a *disease* worthy of being called primary sclerosis of the lateral columns characterized by tetanoid paraplegia without anæsthesia, ataxia, atrophy, or affection of the bladder." He is inclined to believe that the above peculiar train of symptoms is more often due to a diffused myelitis with disease of the central gray substance, rather than a local affection of the lateral columns. This seems to me but a one-sided view of the case as it now stands, and when autopsies are brought forward in cases in which there is *no disease of the lateral columns* whatever, we may question the existence and possibility of lateral disease and its coexistence with the symptoms alluded to so often in this essay. Seguin's cases, as well as all the others, both primary and secondary, present, in some respect, common symptoms which go to make up the disease picture variously called "spasmodic spinal paralysis," "tabes dorsalis spasmodique," or "tetanoid paraplegia," but the question remains to be answered, "Which are the uncomplicated cases? I have endeavored to make the distinction, and if I have succeeded, Seguin's cases, and others of an irregular nature, will come under the head of "secondary degeneration of local origin." So might Leyden's case be considered, and consequently we have no right to say in the absence of contradictory autopsies that it is not possible to have a limited primary degeneration of the lateral columns of the spinal cord.

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The Transactions of the American Medical Association Instituted 1847

Bd.: 30

Philadelphia 1879

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urn:nbn:de:bvb:12-bsb11390725-4